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ORGANON: SOUTHWEST OREGON GROWTH AND YIELD MODEL USER MANUAL

Version 2.0

Arlene S. Hester
David W. Hann
David R. Larsen

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Hester, Arlene S.
ORGANON

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ORGANON
Southwest Oregon Growth and Yield Model User Manual

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INTRODUCTION

Background

The Southwest version of the ORegon Growth ANalysis and projectiON system, SW-ORGANON, has been designed to project the changes that take place in the mixed conifer, young-growth forest stands of southwest Oregon. Such stands should have approximately 80 percent of their basal area in Douglas-fir (Pseudotsuga menziesii [Mirb.] Franco), grand fir (Abies grandis [Dougl. ex D. Don] Lindl.), white fir (Abies concolor [Gord. & Glend.] Lindl.), ponderosa pine (Pinus ponderosa Dougl. exLaws.), sugar pine (Pinus lambertiana Dougl.), and incense-cedar (Calocedrus decurrens Torr.), either singularly or in combination. SW-ORGANON can predict both even-aged and uneven-aged stand development as long as a majority of the trees in the stand are between 15 and 120 years old, as measured at breast height.

ORGANON is an interactive program written in standard FORTRAN 77 code designed specifically to run on an IBM PC or compatible personal computer. The program is "user friendly" and should guide users through its execution. The user manual should help you prepare the tree data input file as well as run the model.

Hardware Requirements

The ORGANON growth model runs on an IBM PC or compatible personal computer operating under the MS-DOS or PC-DOS operating system. The load size of each of the three main components of the ORGANON growth model are:

Module	Approximate Min. Load Size (kilobytes)
START (data entry and edit):	294 K
ORGNON (growth and reports):	493 K
PLTYLD (yield table plotter):	49 K

During model execution, only one module is present in memory. To determine the amount of memory required for execution, add the size of the module, approximately 40K for the operating system, and any memory resident programs that will not be removed. In some circumstances, it may be necessary to remove all memory resident routines in order to obtain enough usable memory for program execution.

Due to the extent of mathematical equations found in ORGANON, the model runs approximately 20 times faster when a math co-processor is installed. This chip, however, is not mandatory.

The computer system must be equipped with at least two 360K floppy disk drives or one 360K floppy drive and one hard disk drive. If frequent output to a report file is requested (yield tables, plots and reports), running times are noticeably shorter on a system with a hard disk. In all other respects, program runs are identical.

Software Requirements

ORGANON is delivered as an executable module. An MS-DOS or DOS operating system environment is necessary to load the program (and overlays as necessary) and provides the program Input/Output requirements and file operations.

What You Need to Know to Use ORGANON

ORGANON users should have a fundamental knowledge of the MS-DOS operating system, including simple file management (printing, name restrictions, etc.), keyboard familiarity, and disk management (default drive, file drive specification and path names if using hard disk subdirectories).

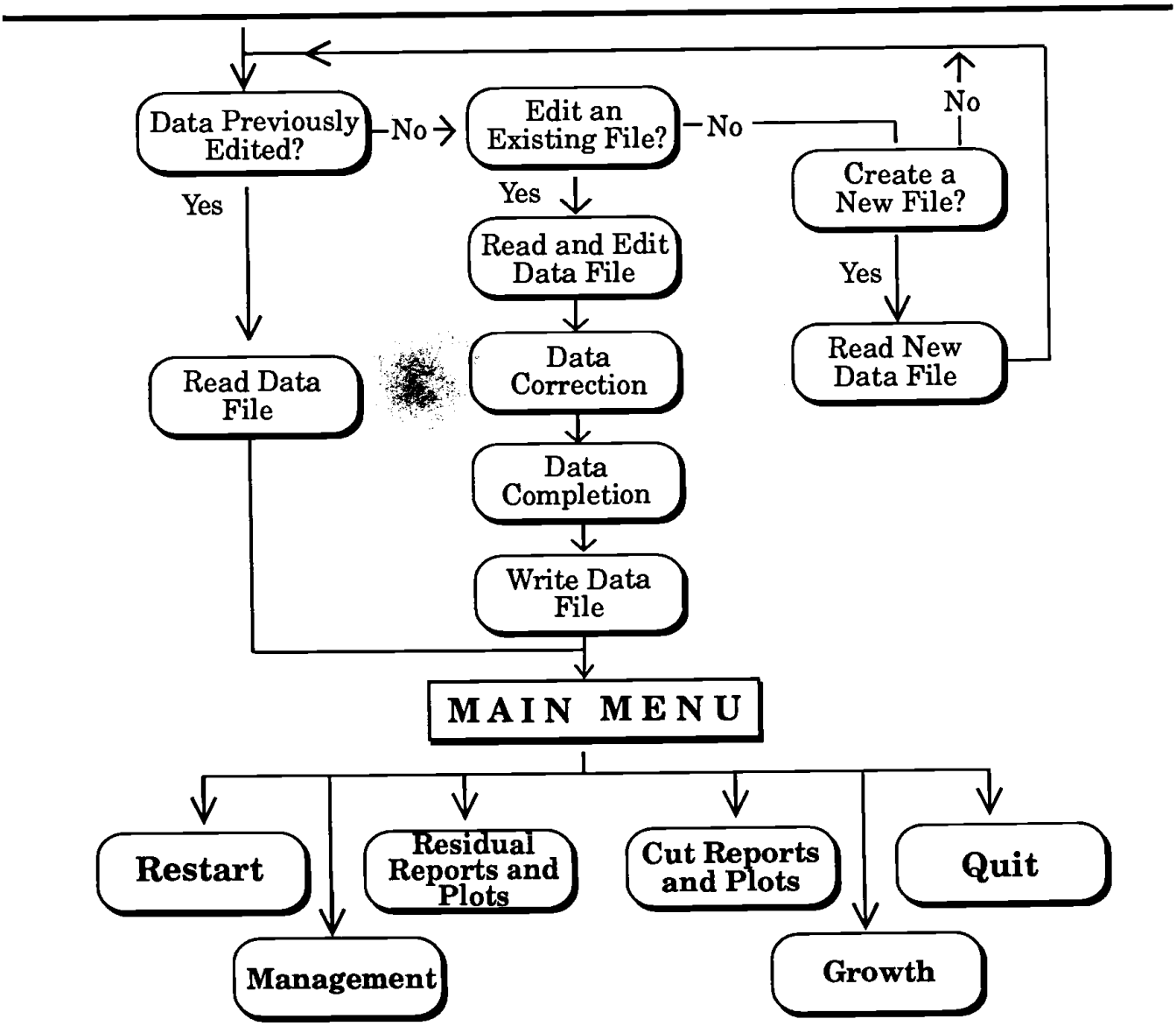
You should realize that computers distinguish the difference between 0 (zero) and O (oh) and 1 (one) versus l (lower case letter L). Please be careful to enter the correct values.

Refer to the MS-DOS and hardware manuals for further information regarding computer operation.

The use of '<CR>' in this manual and on the computer screen during program execution refers to using the key marked either 'carriage return', 'enter' or a bent left arrow (depending on the keyboard). Pressing the carriage return key, depending on the situation, restarts a suspended operation of the program. Otherwise, pressing the carriage return selects a default response designated by parentheses in the request (see Execution Suggestions). This manual designates all user input by printing those responses in bold type.

Overview

The illustration below depicts the entire ORGANON system, showing each of its major components and their relationship to each other.



PROGRAM SETUP

Two-Floppy System

Follow these steps to load and execute ORGANON on a system with two floppy disk drives.

1. Designate the A drive as the default drive and load ORGANON Disk 1 titled 'START' containing files START.EXE and ORGANON.BAT into drive A.

2. Load the data disk containing the tree data file into drive B or a blank disk into drive B if ORGANON will be creating the data file (be sure to include the drive designator 'B:' when specifying the data file name to ORGANON). Type ORGANON to start the program.

3. When prompted by ORGANON, remove Disk 1 (labeled 'START') from drive A and insert Disk 2 (labeled 'ORGNON') into drive A.

INPUT EXAMPLE

(Place the data disk or a blank disk in drive B. Make drive A the default drive. Place Disk 1, 'START', in default drive A:)

B:> **A:**
A:

(type 'ORGANON' to begin execution)

A:> **ORGANON**

(When requested by the program, remove Disk 1 from drive A and insert Disk 2, 'ORGANON')

Hard Disk System

Follow these steps to load and execute ORGANON on a system with one hard drive and one floppy disk drive.

1. (First Time Only)

Designate the hard disk drive as the default drive. Create a new directory (using the DOS command 'MKDIR\dirname'), and move to this new directory (using the DOS command 'CD\dirname') where you will work in ORGANON. If you wish to work on ORGANON in an existing directory, move to that directory. Insert the disks containing the ORGANON program modules into the floppy disk drive and copy all files onto the hard disk. All ORGANON modules are now saved on the hard disk. The following example loads ORGANON onto the subdirectory MODEL. All command lines are executed by pressing the carriage return.

PROGRAM SETUP EXAMPLE

A:> **C:**
C:> **MKDIR\MODEL**
C:> **CD\MODEL**
(insert Disk 1, 'START' in drive A)
C:> **COPY A:*.***
(insert Disk 2, 'ORGNON' in drive A)
C:> **COPY A:*.***

2. Subsequent Runs

Change to the ORGANON directory (DOS command CD\MODEL). If a data file already exists on a floppy disk, load that disk into the floppy drive. If a data file exists on another directory on the hard disk, be sure to designate the path name when ORGANON asks for the file name. To create a data file in ORGANON, insert a blank disk in the floppy drive only if the data file will be saved on a floppy disk (be sure to include the drive designator when entering the file name). If the file is to be saved in the ORGANON directory, no drive designator or floppy disk is necessary.

The following example has an existing data file TESTPLT on a floppy disk.

SETUP EXAMPLE

C:> **CD\MODEL**
(insert data disk in drive B)
C:> **ORGANON**
(when requested by ORGANON, designate the data file by entering **B:TESTPLT**)

The following example has an existing data file TESTPLT on hard disk subdirectory DATA.

SETUP EXAMPLE

C:> **CD\MODEL**
C:> **ORGANON**
(when requested by ORGANON, designate the data file by entering **C:\DATA\TESTPLT**)

The following example has an existing data file TESTPLT on the same directory, MODEL, as the ORGANON program.

SETUP EXAMPLE

C:> **CD\MODEL**
C:MODEL> **ORGANON**
(when requested by ORGANON, designate the date file by entering **TESTPLT**)

PROGRAM PARAMETERS

Logged Drive

The logged (or default) drive is the disk drive the system searches to find the data file name you typed in. If a file does not exist on the logged drive, you must enter a drive designator (i.e. B:) along with the file name. ORGANON then searches the correct directory for the file name designated. If the file is not found in that directory, an error message is displayed on the screen and you must re-enter a file name. For file name errors, be sure you have typed the correct drive designator.

File Names

ORGANON accepts file names that are legal in the DOS operating system. A "legal" file name is 1 to 8 characters in length, and may be followed by a 1 to 3 character extension. See **Filenames, Valid Characters** in the DOS manual for further information. An ORGANON data file name should not, however, have the optional 3-letter extension. After ORGANON reads the raw data file, additional variables are calculated and a new file with the same root name is created. The 3-letter suffix, or file name extension '.INP', is appended to the root file name. This file is written to the same drive from which the original data file was read.

ORGANON DATA EDIT

Measured Tree Data

ORGANON first requests a stand identification name, which is the title that appears at the top of all reports, plots and tables generated by that particular tree data file. ORGANON then reads each variable element of each sample tree in the stand of the data file you entered. A maximum of 2000 trees can be entered for each stand. Measured data for each tree stored in that file includes:

1. Minimum Required Measurements

A stand is described by entering the characteristics of sample trees contained in that stand. You must enter certain measurements of each sample tree, while other measurements are not absolutely required. The minimum required measurements for each tree are:

- ❑ plot/point number
- ❑ species code number
- ❑ diameter outside bark at breast height

2. Strongly Recommended Measurements

In addition to the required tree variables, you should also include the following measurements:

- ❑ total tree height
- ❑ crown ratio

If not included, they are predicted from equations representing regional averages. If these measurements are subsampled, the regional average equations are calibrated to the actual measurements for the stand. For more accurate results, you are strongly urged to collect as many measurements as possible.

3. Optional Measurements

The following set of tree variables is optional for input:

- ❑ expansion factor
- ❑ prior 5-year radial growth
- ❑ user code

If expansion factors are missing from the input file, ORGANON computes the expansion factors based on user-supplied information concerning the sampling design that measured the stand. The remaining optional variables provide more accurate diameter growth predictions and additional thinning capabilities.

Data File Creation

1. Data Elements

The eight data elements that may be entered for each tree in the stand are:

- ❑ plot/point number (required)
- ❑ species code number (required)
- ❑ diameter (outside bark) at breast height (required)
- ❑ total tree height (optional)
- ❑ crown ratio (optional)
- ❑ expansion factor (optional)
- ❑ radial growth (optional)
- ❑ user code (optional)

a. Plot/Point Number (Required)

A plot/point number is a unique integer between 1 and 999 for each sample plot/point. The number does not need to be consecutive or sequential. For plots/points with no trees, enter the plot/point number only with the remainder of the fields blank. This entry is used in determining the number of sample plots/points. The number of sample plots/points is then used to determine the per acre average expansion factor. A plot/

point number of 0 is not valid and will be rejected by ORGANON.

b. Species Code Number (Required)

A species code number is a 3-digit Forest Service code number to identify each tree species. ORGANON models for and accepts only the following tree species and corresponding species codes:

Species Code	Tree Species	Species Code	Tree Species
015	White Fir	312	Bigleaf Maple
017	Grand Fir	361	Pacific Madrone
081	Incense Cedar	431	Golden Chinkapin
117	Sugar Pine	631	Tanoak
122	Ponderosa Pine	805	Canyon Live Oak
202	Douglas Fir	815	Oregon White Oak
263	Western Hemlock	818	California Black Oak

For any tree species not listed, assign a code to the tree from the list above that closely resembles the growth of your unlisted tree species.

c. Diameter at Breast Height (Required)

The diameter at breast height is the outside diameter measured in inches (to the nearest one-tenth inch) at the tree's breast height (approximately 4 1/2 feet above ground on uphill side) for all trees greater than breast height.

d. Total Tree Height (Strongly Recommended)

The total tree height is the height of the tree from ground level to the crown's tip measured in feet (to the nearest one-tenth foot) for all trees.

e. Crown Ratio (Strongly Recommended)

The crown ratio is the length in feet of the live crown (CL) divided by the total tree height (HT). Crown length is the total tree height minus the height to crown base (HCB). In symbolic terms, crown ratio is computed by:

$$R = CL/HT \quad \text{or} \quad 1.0 - HCB/HT$$

When determining the base of the live crown, ignore epicormic and short branches less than 3 feet long. For trees of uneven crown length, visually transfer lower branches on the longer side to fill holes in the upper portion of the shorter side to generate a full, even crown.

f. Expansion Factor (Optional)

The expansion factor is the weight (i.e., number of trees per acre) that each sample tree represents on each plot/point. The program automatically converts this to the stand average (ORGANON divides by the number of points). For a fixed area plot, the expansion factor is the reciprocal of the area of the plot in acres. For variable plots, the expansion factor is the basal area factor in square feet divided by the tree's basal area.

g. Radial Growth (Optional)

The 5-year radial growth inside bark at breast height is measured in decimal inches determined from increment cores. If measured during a growing season, be sure to ignore the current year's growth.

h. User Code (Optional)

A user code is a 1- or 2-digit number assigned to a tree. The user code allows you to designate the tree in some predetermined manner for thinning. For example,

you might code all mistletoe infected trees with one code and assign another code to all non-crop trees. Managers can select these specially coded trees for removal or other action.

2. Word Processor

You can use any word processor that generates an ASCII file to create the data file. An ASCII file is a file that contains no formatting characters (word wrap, formatting, etc.). This is generally referred to as a flat, or non-document file. Wordstar, PC-Write, IBM Personal Editor and MS-DOS Line Editor (EDLIN) can create this type of file. Check your word processor manual for instructions on creating an ASCII file.

Use one line (all characters up to a carriage return) to enter all the data for one tree. The total number of lines in the file should equal the total number of trees being entered plus the number of plots/points without trees.

All data elements should be right justified in their field. If an optional element is not included, enter blanks in its field. For plots or points without trees, be sure to enter the plot/point number only with the remainder of the fields blank. In the following description, an integer refers to a whole number (no decimal point, i.e., 365). A real number implies a decimal number (i.e., 27.4).

Follow the example in the table below to create a data file using a word processor. Be sure to begin editing a non-document file whose file name does NOT include a suffix or extension.

Column #		Comment
1	1-3	Plot/Point number (INTEGER). REQUIRED (e.g.,10).
2	5-7	Species Code number (INTEGER). REQUIRED. One of the 2- or 3-digit codes from section SPECIES CODE NUMBER (e.g., 202).
3	9-13	Diameter Outside Bark at Breast Height in inches (REAL-1 decimal place). REQUIRED (e.g., 27.5).
4	15-19	Total Tree Height in feet (REAL-1 decimal place). STRONGLY RECOMMENDED (5 blanks if omitted, e.g.,134.9).
5	21-24	Crown Ratio (REAL-2 decimal places). STRONGLY RECOMMENDED (3 blanks if omitted, e.g.,63).
6	26-31	Expansion Factor for plot/point (REAL-2 decimal places). ORGANON will divide this value by the number of plot/pointsdetermined during data input. OPTIONAL (6 blanks if omitted, e.g., 25.24).
7	33-37	Radial Growth inside bark in inches (REAL-2 decimalplaces). OPTIONAL (5 blanks if omitted, e.g., 2.91).
8	39-40	User Code (INTEGER). Any designated identification number for user specified thinning. OPTIONAL (2 blanks if omitted, e.g., 2).

SAMPLE TREE DATA INPUT LINE

```
Column   1         2         3         4
1234567890123456789012345678901234567890
 10 202  27.5 134.9  .63  25.24  2.91 2
```

plot/point — species — dbh — ht — cr — exp — radial growth — user code

SAMPLE TREE DATA INPUT LINE
WITH MISSING ELEMENTS

```
Column  1         2         3         4

12345678901234567890123456789012345678 90

 10 202  27.5          .63        2.91
  |  \    |    |      |    |     /
plot/  \  dbh  ht     cr   exp  radial  user
point  species                  growth  code
```

SAMPLE TREE DATA FILE
WITH ERRORS AND OMISSIONS

```
          1         2         3         4
12345678901234567890123456789012345678 90

 1 202   7.8   43.3  .73
 1 202         45.9  .94
 1 202   9.0   40.2  .89
 1 202  11.1         .99
 1 202   4.9   35.6  .98
 1 202   3.3   21.9  .86
 1 202   3.0   19.8  .85
 2 202  10.4   45.0  .88
 2 202   9.8   46.6  .91
 2 202  11.6   58.3  .95
 2 202   4.1   31.2  .89
 2 202   7.6   43.6  .92
 2 202   4.4   30.4  .92
 2 202   4.6   35.3  .73
 2 202    .2    4.5  .87
 3 199   6.3   36.7  .92
 3 202   3.6   20.2  .95
      (blank line)
 3 202   3.9   22.5  .98
 4 202   5.1   30.7  .95
 5     (plot with no trees)
```

3. ORGANON Setup

An optional method of creating a data file exists within ORGANON. If your data has not been edited before, and you will not edit an existing file, you have only one other choice--let ORGANON create a new data file. ORGANON prompts you to enter each of the tree data elements, one element at a time, one tree at a time. ORGANON formats the data in an ASCII file format. The ORGANON setup cannot be used to add a tree or modify a tree on an existing tree data file. However, you can use a word processor to add or edit an existing file. Another option is to use the on-line editor of ORGANON to add, delete or modify a tree record.

ORGANON DATA FILE SETUP EXAMPLE

```
C:> CD\MODEL
C:MODEL> ORGANON

Has your data file been previously edited? (Y)- N
Do you want to edit an existing data file? (Y)- N
Do you want to 'create' a new data file? (Y)- Y
Enter your 8 letter file name (NO EXTENSION)-
TESTPLT

TREE #   1

Plot/Point Number (Required-Integer) --> 1
Tree Species Code (Required-Integer) --> 202
Diameter at Breast Height (Required-Real) --> 7.8
Height in feet (Optional-Real) --> 43.3
Crown Ratio (Optional-Real) --> .73
Expansion Factor  (Optional-Real) --> <CR>
Radial Growth in inches (Optional-Real) --> <CR>
User 2-digit thinning code (Optional-Integer) --> 2
Species: 202
DBH:    7.8
HT:    43.3
CR:     .73
EXP:    .0
RADGRO:  .00
USER:    2              Save this tree (Y)? <CR>
Another tree (Y)? <CR>
```

Data Read and Edit

After you create a data file and/or have specified that a data file has not been previously edited, the file is ready for input into ORGANON.

1. Error and Warning Detection

As ORGANON reads an input file, the

raw data is scanned for errors. As errors are detected, only the trees with errors are identified and displayed on the screen unless you request the model to list every tree record in the file. If you request this option, ORGANON prompts you to connect and ready the printer. Ignore this prompt if a hard copy is unnecessary. The printer MUST be connected later in the program to print reports if they are sent to the printer. After all the data are read, ORGANON provides an error summary. These errors may include:

1. Plot/Point number of 0
2. Missing variables that are REQUIRED
3. DBH of 0 inches
4. Illegal species code
5. Blank records
6. Total tree height of 4.5 inches or under

Along with the fatal errors detected, ORGANON also displays if STRONGLY RECOMMENDED and OPTIONAL variables have been entered and if any plots/points were entered with "no trees."

ERROR AND WARNING DETECTION EXAMPLE

C:> **CD\MODEL**
C:\MODEL> **ORGANON**

Has your data file been previously edited?(Y)> **N**
Do you want to edit an existing file?(Y)> **<CR>**
Stand I.D. (20 char max)?> **TEST PLOT278**

Tree data file name [NO extension (i.e. A:MYFILE)] ---> **PLOT278**
Display data as well as errors during read?(N)> **<CR>**
*** DBH=0.0 FOR TREE 2 IS NOT VALID
*** HEIGHT<= 4.5" FOR TREE 15 IS NOT VALID
*** ILLEGAL SPECIES CODE 199 FOR TREE 16
*** ILLEGAL PLOT/POINT NUMBER OR BLANK LINE FOR TREE 18
*** RECORD WILL BE IGNORED***
*** WARNING -- POINT 5 HAS NO TREES
20 records have been read...
<CR> to continue...
The following are the data scan results...
Errors MUST be corrected before model is run.

ERROR AND WARNING DETECTION EXAMPLE
(continued)

ILLEGAL SPECIES CODES ARE PRESENT...
All point numbers are legal...
ILLEGAL DBH EXISTS ...
THERE ARE ILLEGAL TREE HEIGHTS...
All crown ratios are present...
THERE ARE EXPANSION FACTORS MISSING...(not reqd)
SOME RADIAL GROWTHS WERE NOT INPUT...(not reqd)
THERE ARE MISSING TREE HEIGHTS... (not reqd)
1 PLOT WITH NO TREES

Data entry is completed...
You will be entering the correction module.

2. Error Correction

After the tree data has been read and an error and warning listed, you can use a simple on-line editor to add, delete, list or change any of the tree record variables. You can inspect a list of all errors to be corrected if desired. Entering a carriage return (<CR>) terminates the on-line editor as long as all detected errors have been corrected.

ERROR CORRECTION EXAMPLE

ORGANON ON-LINE EDITOR OPTION

20 RECORDS CURRENTLY IN FILE 'PLOT278
CONSISTING OF:
19 original tree records
1 original plot with no trees
0 added tree records
0 added plots with no trees
0 records flagged for deletion
0 tree records
0 plot records with no trees
20 records remaining after deletion
19 tree records
1 plot record with no trees

ERROR CORRECTION EXAMPLE
ORGANON ON-LINE EDITOR OPTION
[continued]

ENTER	TO PERFORM
ERR	ERRORS to correct
LST	LIST all records
ADD	ADD a record
(record number)	EDIT (record number)

[<CR> to END]

CORRECT --->

a. Errors to Correct

You must correct all fatal errors before the model can operate. When ORGANON reads data, errors are tagged for later detection. Entering 'ERR' during an on-line editing session lists all remaining record errors to correct.

ERROR CORRECTION EXAMPLE
ORGANON ON-LINE EDITOR OPTION

20 RECORDS CURRENTLY IN FILE PLOT278
CONSISTING OF:
19 original tree records
1 original plot with no trees
0 added tree records
0 added plots with no trees
0 records flagged for deletion
0 tree records
0 plot records with no trees
20 records remaining after deletion
19 tree records
1 plot record with no trees

ENTER	TO PERFORM
ERR	ERRORS to correct
LST	LIST all records
ADD	ADD a record
(record number)	EDIT (record number)

[<CR> to END]

CORRECT --->**ERR**
Tree # 2
DBH = 0
Tree # 15
illegal tree height
Tree # 16
bad species code
<CR> to continue...

b. List All Records

You can, at any time, get a current listing of all tree records in the stand by using the LST option. This listing displays plots with no trees, as well as all the records flagged for deletion. Records flagged for deletion display '**' for a species code.

ERROR CORRECTION EXAMPLE
ORGANON ON-LINE EDITOR OPTION

20 RECORDS CURRENTLY IN FILE PLOT278
CONSISTING OF:
:

ENTER	TO PERFORM
ERR	ERRORS to correct
LST	LIST all records
ADD	ADD a record
(record number)	EDIT (record number)

[<CR> to END]

CORRECT --->**LST**

tree point	species		dbh	height	crown ratio	exp factor	radgro	user code
1	1	DF	7.8	43.3	.73	.00	.00	0
2	1	DF	.0	45.9	.94	.00	.00	0
3	1	DF	9.0	40.2	.89	.00	.00	0
4	1	DF	11.1	.0	.99	.00	.00	0
5	1	DF	4.9	35.6	.98	.00	.00	0
6	1	DF	3.3	21.9	.86	.00	.00	0
7	1	DF	3.0	19.8	.85	.00	.00	0
8	2	DF	10.4	45.0	.88	.00	.00	0
9	2	DF	9.8	46.6	.91	.00	.00	0
10	2	DF	11.6	58.3	.95	.00	.00	0
11	2	DF	4.1	31.2	.89	.00	.00	0
12	2	DF	7.6	43.6	.92	.00	.00	0
13	2	DF	4.4	30.4	.92	.00	.00	0
14	2	DF	4.6	35.3	.73	.00	.00	0
15	2	DF	.2	4.5	.87	.00	.00	0
16	3	**	6.3	36.7	.92	.00	.00	0
17	3	DF	3.6	20.2	.95	.00	.00	0
18	3	DF	3.9	22.5	.98	.00	.00	0
19	4	DF	5.1	30.7	.95	.00	.00	0
20	5	PLOT WITH NO TREES						

<CR> to continue...

c. Modify a Record

To modify any variable of a tree, or to delete a tree entirely, first enter the tree record number. This tree number is the record number assigned during data file input. You can also obtain this number by selecting the LST option above and listing the file on the screen. This number is useful only for editing purposes.

After you select a record number, ORGANON displays all variables of that record. All modifications to tree variables made during on-line editing are saved only in the '.INP' file. The original raw data file remains unchanged. Strongly Recommended and Optional tree variables that were not entered appear as 0 during on-line editing. These zero values do not need to be corrected as the DATA COMPLETION routine calculates and fills in the missing values. Errors in the Strongly Recommended and Optional variables, however, must be corrected as these values are used to calculate calibration factors in the DATA COMPLETION routine.

Select a variable for modification by entering the variable's number (a value from 1 to 8). ORGANON prompts you for the new value for that variable. All data checks made during initial data input are repeated as each new variable value is entered. After the new value for a tree record is accepted, all tree variables are again displayed, as are any changes made.

If an entire tree record is to be deleted, select its tree number when prompted. After all the tree variables are displayed, select option 9--DELETE/UNDELETE RECORD. The tree remains in the list, but is flagged for deletion after you leave the editor. You can also delete a plot with no trees in this manner. Option 9 is also useful to remove the deletion flag in order to restore a tree to the tree list.

ERROR CORRECTION EXAMPLE
ORGANON ON-LINE EDITOR OPTION

20 RECORDS CURRENTLY IN FILE PLOT278
CONSISTING OF:
19 original tree records
1 original plot with no trees
0 added tree records
0 added plots with no trees
0 records flagged for deletion
0 tree records
0 plot records with no trees
20 records remaining after deletion
19 tree records
1 plot record with no trees

ENTER	TO PERFORM
ERR	ERRORS to correct
LST	LIST all records
ADD	ADD a record
(record number)	EDIT (record number)

[<CR> to END]
CORRECT --->**2**

Tree # 2

1)	POINT:	1
2)	SPECIES :	DF
3)	DIAMETER :	.0
4)	HEIGHT :	45.9
5)	CROWN RATIO :	.94
6)	EXPANSION :	.00
7)	RADIAL GROWTH :	.00
8)	USER CODE :	0
9)	DELETE/UNDELETE	

[<CR> to END]
ITEM # TO CORRECT ---> **3**
Enter (decimal) variable value ---> **11.1**

1)	POINT:	1
2)	SPECIES :	DF
3)	DIAMETER :	11.1
4)	HEIGHT :	45.9
5)	CROWN RATIO :	.94
6)	EXPANSION :	.00
7)	RADIAL GROWTH :	.00
8)	USER CODE :	0
9)	DELETE/UNDELETE	

[<CR> to END]
ITEM # TO CORRECT ---> **<CR>**
(continued)

ERROR CORRECTION EXAMPLE (continued)

ORGANON ON-LINE EDITOR OPTION

20 RECORDS CURRENTLY IN FILE 'PLOT278'
CONSISTING OF:
19 original tree records
1 original plot with no trees
0 added tree records
0 added plots with no trees
0 records flagged for deletion
0 tree records
0 plot records with no trees
20 records remaining after deletion
19 tree records
1 plot record with no trees

ENTER	TO PERFORM
ERR	ERRORS to correct
LST	LIST all records
ADD	ADD a record
(record number)	EDIT (record number)

[<CR> to END]

CORRECT --->**20**

1)	POINT:	5
2)	SPECIES :	' '
3)	DIAMETER :	.0
4)	HEIGHT :	.0
5)	CROWN RATIO :	.00
6)	EXPANSION :	.00
7)	RADIAL GROWTH :	.00
8)	USER CODE :	0
9)	DELETE/UNDELETE	

[<CR> to END]
ITEM # TO CORRECT ---> **9**
Record # 20 flagged for deletion...

ERROR CORRECTION EXAMPLE

ORGANON ON-LINE EDITOR OPTION

20 RECORDS CURRENTLY IN FILE 'PLOT278'
CONSISTING OF:
19 original tree records
1 original plot with no trees
0 added tree records
0 added plots with no trees
1 record flagged for deletion
0 tree records
1 plot records with no trees
19 records remaining after deletion
19 tree records
0 plot records with no trees

ENTER	TO PERFORM
ERR	ERRORS to correct
LST	LIST all records
ADD	ADD a record
(record number)	EDIT (record number)

[<CR> to END]

CORRECT --->**ADD**

1)	POINT:	0
2)	SPECIES :	' '
3)	DIAMETER :	.0
4)	HEIGHT :	.0
5)	CROWN RATIO :	.00
6)	EXPANSION :	.00
7)	RADIAL GROWTH :	.00
8)	USER CODE :	0
9)	DELETE/UNDELETE	

[<CR> to END]
ITEM # TO CORRECT ---> 1

Enter variable value for item 1) **8**

(continue entering variables for new tree)

(continued)

d. Add a Record

The ADD option allows you to add new records to the tree list. A 'null' record is displayed on the screen and each variable of the record is subsequently modified to describe the tree added. You can add a plot with no trees to the tree list by specifying ADD, designating a plot number, and leaving the remaining variables zero.

ERROR CORRECTION EXAMPLE

ORGANON ON-LINE EDITOR OPTION

21 RECORDS CURRENTLY IN FILE 'PLOT278'
CONSISTING OF:
19 original tree records
1 original plot with no trees
1 added tree records
0 added plots with no trees
2 records flagged for deletion
1 tree records
1 plot records with no trees
19 records remaining after deletion
19 tree records
0 plot records with no trees

ENTER	TO PERFORM
ERR	ERRORS to correct
LST	LIST all records
ADD	ADD a record
(record number)	EDIT (record number)

[<CR> to END]
(continued)

NOTE: To continue to follow the examples shown in this manual using test file PLOT278, perform the following corrections.
Record #15 - change height to 5.2'
Record #16 - make species code 202 (DF)
Record #21 - delete added plot 8 record

ERROR CORRECTION EXAMPLE (continued)

CORRECT ---> **<CR>**

4 points determined for TEST PLOT278
<CR> to continue

3. Productivity Variables

a. Site Indexes

ORGANON requests two site indexes--Douglas-fir and Ponderosa Pine. You must enter at least one of the two site indexes. If both values are entered, both are used. If only one value is entered, the site index not entered is calculated from the entered site index. Guidelines for measuring site index can be found in Hann and Scrivani (1987).

SITE INDEXES EXAMPLE

Douglas Fir (total height) site index? ->**109.4**

Ponderosa Pine (total height) site index? ->**102.9**

b. Even/Uneven Age Stand

You may enter the sample stand as an even- or uneven-aged stand.

SITE INDEXES EXAMPLE

Even-age Stand? (Y) ---> **<CR>**

c. Stand Age

If you enter an even-age stand, ORGANON prompts you for the stand age as measured by breast height diameter. You have the option to enter the number of years to breast height to determine total stand age. If this entry is blank, ORGANON determines the total stand age. Total stand age will be the age displayed in all tables and plots, and in calculations of mean annual increment (MAI).

The growth and mortality equations in ORGANON do not utilize stand age as an independent variable (i.e., they are age independent).

STAND AGE EXAMPLE

Even-age Stand? (Y) ---> **<CR>**
Breast height stand age? ---> **28**
Do you want to enter number of years
to reach breast height?
(N - ORGANON will calculate) ---> **<CR>**

4. Data Completion

a. Expansion Factor

ORGANON allows very flexible calculation of expansion factors from a wide variety of sample systems.

Three methods for defining an expansion factor are available:

1. describe expansion
2. use default expansion file
3. create default expansion file.

```
EXAMPLE OF EXPANSION FACTOR
INPUT METHOD

[ EXPANSION DEFAULT SELECTION ]

1 - Describe Expansion
2 - Use Default Expansion file 'ORGANON.EXP'
3 - Create 'ORGANON.EXP'
      [ <CR> = Describe Expansion ]
INPUT --->
```

1. Describe Expansion

With this input method, ORGANON prompts you to describe the sample unit. A sample unit is composed of one or more sub-sample units at a single location and with a common center. These subsamples are called "nested subsamples." ORGANON allows a maximum of five nested subsamples per sample unit.

You can label fixed area subsample values by the square foot size, by the fractional amount of an acre, or by the radius of a circular plot.

You can label a variable radius plot/point subsample by its basal area factor.

When you select nested subsamples, the diameter of each tree determines the subsample into which it lies and the appropriate expansion factor formula for that subsample. To set these diameter limits for nested subplots, ORGANON prompts you to list the lower diameter limit for each subplot.

```
DESCRIBE EXPANSION FACTOR EXAMPLE

Expansion factor calculation for all trees ...

Did you use nested subsamples? ---> Y
Enter the number of subsamples ---> 3


START WITH SMALLEST DIAMETER
SUBSAMPLE


SUBSAMPLE 1:
Fixed radius/area (ie. sq ft)-- F
Variable radius (ie. point)---- V
 (enter F or V) ---> F

Fixed area plot determined by...
1. Square Feet
2. Fractional Acres (X as in 1/X)

      ENTER 1, 2 OR 3 ---> 3
      Enter value ---> 7.78


SUBSAMPLE 2:
Fixed radius/area (ie. sq ft)-- F
Variable radius (ie. point)---- V
(enter F or V) ---> F

Fixed area plot determined by...
1. Square Feet
2. Fractional Acres (X as in 1/X)
3. Radius
      ENTER 1, 2 OR 3 ---> 3
      Enter value ---> 15.56


SUBSAMPLE 3:
Fixed radius/area (ie. sq ft)-- F
Variable radius (ie. point)---- V
(enter F or V) ---> V


Enter basal area factor in sq. ft. (BAF)--> 20

                (continued)
```

```
EXAMPLE OF DESCRIBE
EXPANSION FACTOR EXAMPLE (continued)

EXPANSION FACTORS FOR FILE: PLOT278

SUBSAMPLE 1:
  Fixed -- PLOT RADIUS (FT) =     7.78
SUBSAMPLE 2:
  Fixed -- PLOT RADIUS (FT) =    15.56
SUBSAMPLE 3:
  Variable radius - 20. BAF

Would you like to re-enter? (N) ---> <CR>

Upper and lower limits must be assigned to
the 3 subsamples.

Enter limits and adjustment will be made as follows:

0 4 8 12  (4 subsamples)  results in:
     1) 0.0 < DBH <= 4.0"   (SUBSAMPLE 1)
     2) 4.0 < DBH <= 8.0"   (SUBSAMPLE 2)
     3) 8.0 < DBH <= 12.0"  (SUBSAMPLE 3)
     4) DBH > 12.0"         (SUBSAMPLE 4)

Enter limits for subsamples ---> 0 4 8

LIMITS HAVE BEEN SET AS FOLLOWS:

     1) .0 < DBH <= 4.0"    (SUBSAMPLE 1)
     2) 4.0 < DBH <= 8.0"   (SUBSAMPLE 2)
     3) DBH > 8.0"          (SUBSAMPLE 3)

Would you like to re-enter? (N) ---> <CR>

***please wait --- expansion factors
   are being calculated
```

2. Use Default Expansion File

A default expansion file, ORGANON.EXP, which describes a commonly used sampling method, can provide answers to all of ORGANON's prompts as described in input method 1.

When you select the default expansion file as the input method, ORGANON displays the file and prompts you to verify acceptance of the sampling description. If the default description is unacceptable, you must select another sampling input method.

```
USE DEFAULT EXPANSION FILE EXAMPLE

    [ EXPANSION DEFAULT SELECTION ]
1 - Describe Expansion
2 - Use Default Expansion file 'ORGANON.EXP
3 - Create 'ORGANON.EXP'
        [ <CR> = Describe Expansion ]
INPUT ---> 2

EXPANSION FACTORS FOR FILE: PLOT278

SUBSAMPLE 1:
  Fixed -- PLOT RADIUS (FT) =     7.78
SUBSAMPLE 2:
  Fixed -- PLOT RADIUS (FT) =    15.56
SUBSAMPLE 3:
  Variable radius - 20.0 BAF

LIMITS HAVE BEEN SET AS FOLLOWS:

     1) .0 < DBH <= 4.0"    (SUBSAMPLE 1)
     2) 4.0 < DBH <= 8.0"   (SUBSAMPLE 2)
     3) DBH > 8.0"          (SUBSAMPLE 3)

Reject these defaults? (N) ---> <CR>

***please wait --- expansion factors
   are being calculated
```

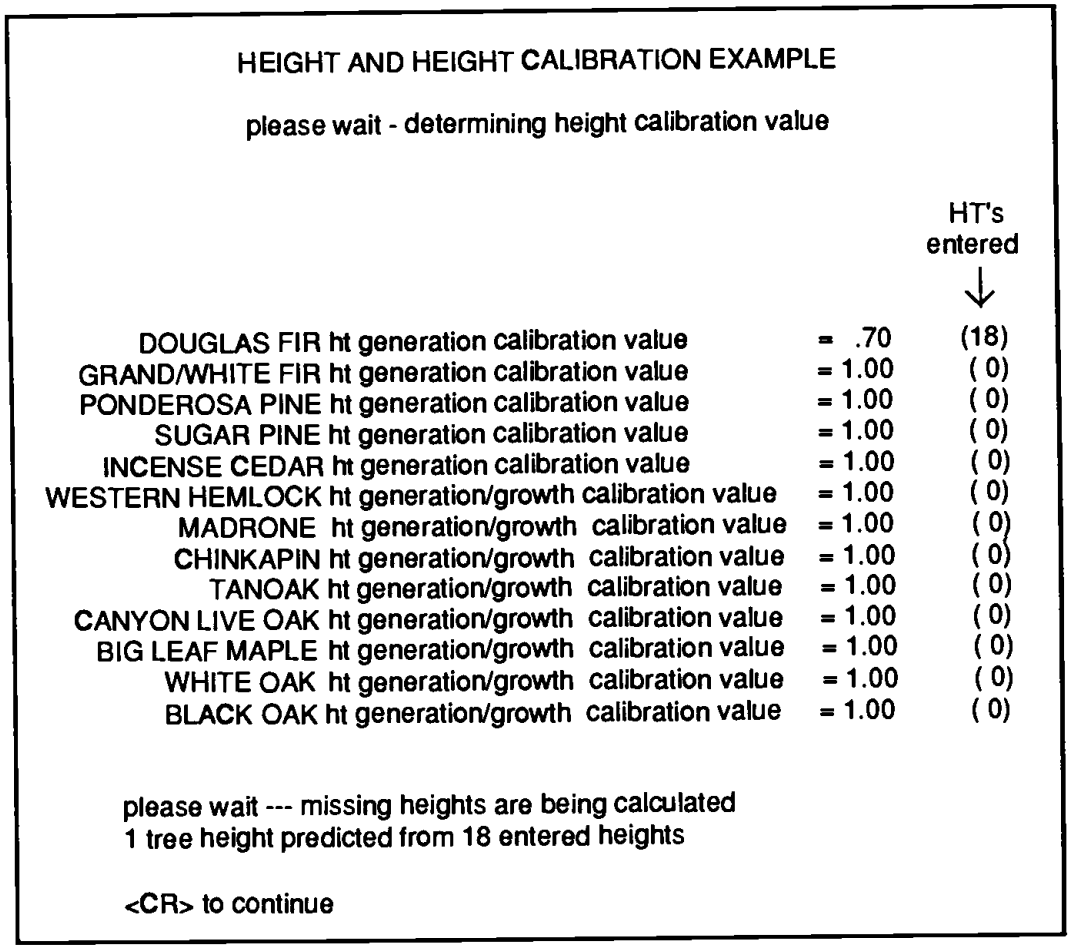
3. Create Default Expansion File

In order to avoid repetition when a sampling unit description is used frequently, ORGANON can create a default file containing that description. The file is created responding to prompts as previously described in input method 1. Thereafter, the default file can be used to "answer" prompts by selecting input method 2.

b. Height and Height Calibration

ORGANON makes two passes through the input data file to determine height calibration values and to generate missing

heights. The first pass through the data predicts heights for all trees in the stand having measured heights. ORGANON uses this predicted height along with the measured height to determine a calibration value by species, using weighted, simple linear regression through the origin. If the calibration value for a species is not significantly different (p=0.99) from 1.0, the calibration value is set to 1.0. If the calibration value is determined to be greater than 2.0 or less than 0.5, the calibration value for that species is set to 2.0 or 0.5 respectively. A calibration value of 1.4 (or .85) signifies that the sample heights were on the average 1.4 times (or .85 times) the height determined by the height/diameter equations developed for ORGANON. These calibration values are used during prediction of missing heights for all species and during height growth for minor species. You can specify the use of these values during growth before each ORGANON run (see RUN DEFAULTS).


HEIGHT AND HEIGHT CALIBRATION EXAMPLE
please wait - determining height calibration value
HT's entered
DOUGLAS FIR ht generation calibration value = .70 (18)
GRAND/WHITE FIR ht generation calibration value = 1.00 (0)
PONDEROSA PINE ht generation calibration value = 1.00 (0)
SUGAR PINE ht generation calibration value = 1.00 (0)
INCENSE CEDAR ht generation calibration value = 1.00 (0)
WESTERN HEMLOCK ht generation/growth calibration value = 1.00 (0)
MADRONE ht generation/growth calibration value = 1.00 (0)
CHINKAPIN ht generation/growth calibration value = 1.00 (0)
TANOAK ht generation/growth calibration value = 1.00 (0)
CANYON LIVE OAK ht generation/growth calibration value = 1.00 (0)
BIG LEAF MAPLE ht generation/growth calibration value = 1.00 (0)
WHITE OAK ht generation/growth calibration value = 1.00 (0)
BLACK OAK ht generation/growth calibration value = 1.00 (0)
please wait --- missing heights are being calculated
1 tree height predicted from 18 entered heights
<CR> to continue

c. Crown Ratio and Crown Ratio Calibration

ORGANON makes two passes through the input data file to determine crown ratio calibration and to generate missing crown ratios. The first pass through the data calculates crown ratios for all trees in the stand having measured crown ratios. ORGANON uses this predicted crown ratio along with the measured crown ratio to determine a calibration value by species, using weighted, simple linear regression through the origin. If the value for a species is not significantly different (p=0.99) from 1.0, the calibration value is set to 1.0. If the calibration value is determined to be greater than 2.0 or less than 0.5, the calibration value for that species is set to 2.0 or 0.5, respectively. A calibration value of 1.4 (or .85) signifies that the sample crown ratios were on the average 1.4 times (or .85 times) the crown ratios determined by the height-to-crown base equations developed for ORGANON. ORGANON uses this value to predict the missing crown ratios. During missing crown ratio calculations, height-to-crown base is calculated. If it is greater than 95% of the height, the height-to-crown base is set to 95% of the height. If the calibrated height-to-crown base is less than 0, the calibrated height-to-crown base is set to 0. During crown change, if the crown ratio is less than 0.5%, it is set to 0.5%. The use of these values during growth can be specified before each ORGANON run (see RUN DEFAULTS).

CROWN RATIO CALIBRATION EXAMPLE

please wait - determining crown ratio calibration value

		CR's entered
DOUGLAS FIR	crown ratio calibration value = 1.23	(19)
GRAND/WHITE FIR	crown ratio calibration value = 1.00	(0)
PONDEROSA PINE	crown ratio calibration value = 1.00	(0)
SUGAR PINE	crown ratio calibration value = 1.00	(0)
INCENSE CEDAR	crown ratio calibration value = 1.00	(0)
WESTERN HEMLOCK	crown ratio calibration value = 1.00	(0)
MADRONE	crown ratio calibration value = 1.00	(0)
CHINKAPIN	crown ratio calibration value = 1.00	(0)
TANOAK	crown ratio calibration value = 1.00	(0)
CANYON LIVE OAK	crown ratio calibration value = 1.00	(0)
BIG LEAF MAPLE	crown ratio calibration value = 1.00	(0)
WHITE OAK	crown ratio calibration value = 1.00	(0)
BLACK OAK	crown ratio calibration value = 1.00	(0)

please wait - missing crown ratios are being calculated
0 crown ratios predicted from 19 entered crown ratios

<CR> to continue

d. Diameter Calibration

If you enter radial growth values, the diameter calibration values are determined by species using weighted, simple linear regression through the origin. The stand is back-dated and then grown in order to compare actual diameter growth with predicted diameter growth. No missing radial growths are predicted. If the calibration value for a species is not significantly different (p=0.99) from 1.0, the calibration value is set to 1.0. If the calibration value is determined to be greater than 2.0 or less than 0.5, the calibration value for that species is set to 2.0 or 0.5, respectively. A calibration value of 1.4 (or .85) signifies that the radial growths were on the average 1.4 times (or .85 times) the radial growths determined by the equations developed for ORGANON. You can specify the use of these values to adjust diameter growth predictions before each ORGANON run (see RUN DEFAULTS).

DIAMETER CALIBRATION EXAMPLE

please wait - determining diameter calibration value

		RADGRO's entered ↓
DOUGLAS FIR diameter growth calibration =	1.00	(0)
GRAND/WHITE FIR diameter growth calibration =	1.00	(0)
PONDEROSA PINE diameter growth calibration =	1.00	(0)
SUGAR PINE diameter growth calibration =	1.00	(0)
INCENSE CEDAR diameter growth calibration =	1.00	(0)
WESTERN HEMLOCK diameter growth calibration =	1.00	(0)
MADRONE diameter growth calibration =	1.00	(0)
CHINKAPIN diameter growth calibration =	1.00	(0)
TANOAK diameter growth calibration =	1.00	(0)
CANYON LIVE OAK diameter growth calibration =	1.00	(0)
BIG LEAF MAPLE diameter growth calibration =	1.00	(0)
WHITE OAK diameter growth calibration =	1.00	(0)
BLACK OAK diameter growth calibration =	1.00	(0)

<CR> to continue

e. Calibration and Actual Data Plots

After height, height-to-crown base, and diameter calibrations are made, plots are available for the calibrated variables listed above. These plots show predicted minus actual values (i.e., residuals) on the Y-axis, and predicted values on the X-axis for height, height-to-crown base and diameter growth. These plots are available both with and without the calibration ratios incorporated in the prediction. In addition, plots are also available showing actual height or crown ratio on the Y-axis and actual diameter on the X-axis. The plots that are available depend on the data entered (i.e., no plots with calibration are available if the calibration value is equal to 1.0). Output for these plots only goes to the screen. For hard copy output, use the appropriate DOS command. You may request these plots any number of times with different species. The digit actually plotted represents the number of input trees that fall into the range represented by that cell. The plots of calibrated and uncalibrated residuals over predicted values can be used to:

1. Examine the data for possible "outliers"(large positive or negative residuals) arising from measurement errors in the original input data. If "outliers" are to be corrected, you can use an external editor or the ORGANON editor by re-entering the data file.

2. Determine the effectiveness of the calibration value in improving the fit of the original input data to the regional equations in ORGANON. Ideally, the variation of the residuals across the predicted value should be homogeneous (the upper and lower bounds of the residuals should be horizontal), the sum of the residuals should be zero, and the residuals should exhibit no trends across the predicted values. If the calibrated residuals exhibit these features, then use of the calibration values is recommended. In the following example, the calibration value provided a better fit to the data. You should use the calibration value because, in this case, it gives a better fit to the data.

CALIBRATION AND ACTUAL PLOTS EXAMPLE
[PLOTS OF CALIBRATION AND ACTUAL DATA]

[No Calibration]
HT - (Predicted Ht-Actual Height) vs Pred. Ht.
CR - (Predicted HTCB-Act. HTCB) vs Pred.HTCB
DG - (Predicted DG-Actual DG) vs Pred. DG

[With Calibration]
HTC - (Predicted Ht-Actual Height) vs Pred. Ht.
CRC - (Predicted HTCB-Act. HTCB) vsPred.HTCB
DGC - (Predicted DG-Actual DG) vs Pred. DG

[PLOTS OF ACTUAL DATA]
HTD - Actual Height vs Actual Diameter
CRD - Actual Crown Ratio vs Actual Diameter
DGD - Actual Diameter Growth vs Act. Diameter
[<CR> to End]

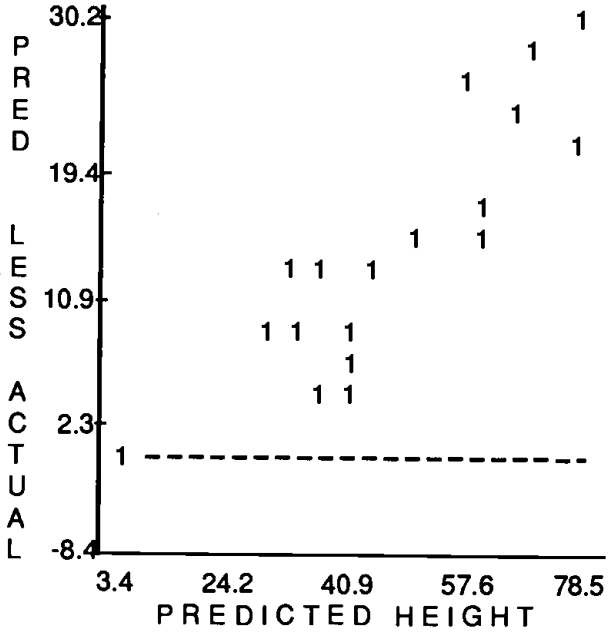
CALIBRATION PLOTS ---> **HT**
SPECIES GROUP (AL) ---> **<CR>** (See section SPECIES under TABLE AND PLOT PARAMETERS for further explanation)

(continued)

CALIBRATION AND ACTUAL PLOTS EXAMPLE
(continued)

NOTE: The actual menu for test PLOT278 would not include the DG, DGC and DGD because PLOT278 had no radial growth measurements entered.

TEST PLOT278 [11-24-88 8:35 AM]
{Pred. Ht. - Act. Ht.} vs. Pred. Ht. (No Calibration) for all species



<CR> to continue **<CR>**

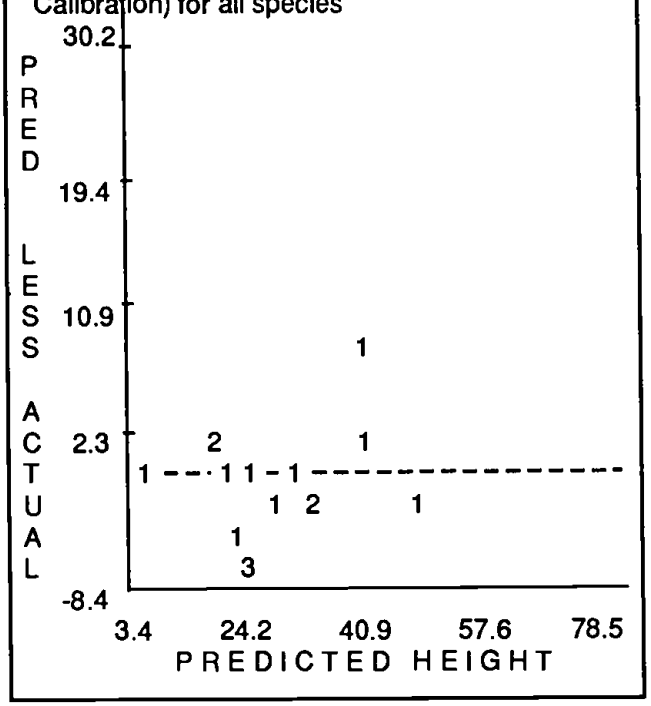
[PLOTS OF CALIBRATION AND ACTUAL DATA]
[No Calibration]
HT - (Predicted Ht.-Actual Ht.) vs Pred. Height
CB - (Predicted HTCB-Act HTCB) vs Pred. HTCB
DG - (Predicted DG-Actual DG) vs Pred. DG

[With Calibration]
HTC - (Predicted Ht-Actual Ht) vs Pred. Ht.
CBC - (Pred. HTCB-Act. HTCB) vs Pred. HTCB
DGC - (Predicted DG-Actual DG) vs Pred. DG

[PLOTS OF ACTUAL DATA]
HTD - Actual Height vs Actual Diameter
CRD - Actual Crown Ratio vs Act. Diameter
DGD - Actual Diameter Growth vs Act. Diameter

[<CR> to End]
CALIBRATION PLOTS ---> **HTC**
SPECIES GROUP (AL) ---> **<CR>**
(continued)

CALIBRATION AND ACTUAL PLOTS EXAMPLE
(continued)



After all requested plots are displayed, press the carriage return to erase the plot menu display. ORGANON writes the corrected, completed data file to an '.INP' file (see '.INP' FILES)

CALIBRATION AND ACTUAL PLOTS EXAMPLE

[PLOTS OF CALIBRATION AND ACTUAL DATA]
[No Calibration]

HT -(Predicted Ht-Actual Ht) vs Pred. Height
CB -(Predicted HTCB-Act HTCB) vs Pred. HTCB
DG -(Predicted DG-Actual DG) vs Pred. DG
[With Calibration]

HTC -(Predicted Ht-Actual Ht) vsPred. Height
CBC -(Predicted HTCB-Act HTCB) vsPred.HTCB
[PLOTS OF ACTUAL DATA]

HTD - Actual Height vs Actual Diameter
CRD - Actual Crown Ratio vs Act Diameter
DGD - Actual Diameter Growth vs Act Diameter
[<CR> to End]

CALIBRATION PLOTS ---> **<CR>**
completed tree data is being written to file:
PLOT278.INP

.INP Files

After ORGANON reads the raw data file, makes data corrections, and computes data completion and productivity values, the completed stand description file is saved and written to the same drive from which ORGANON read the original raw data file. The data file name is the original data file name (the root file name), with a 3-letter suffix or file name extension of '.INP'. This file cannot be read or altered, because it is represented in a binary format.

ORGANON MODEL EXECUTION

The main ORGANON module loads into memory after you have designated that raw data file(s) have been correctly processed and a valid '.INP' file exists for each raw data file. When the main ORGANON module has loaded, you must select which '.INP' data files you will enter and allow to be processed by the growth model. You must also choose a file to write the requested tables and plots to.

```
                    O R G A N O N

              Growth and Yield Project
        Southwest Oregon Mixed Conifer Forests
      SW OREGON VERSION, ED2.0 - #SWO-0000
          Copyright 1988 College of Forestry
              Oregon State University

Has your data file been previously edited?(Y)<CR>

    [Please wait...the main ORGANON model
     is loading ]

                    O R G A N O N

              Growth and Yield Project
        Southwest Oregon Mixed Conifer Forests
      SW OREGON VERSION, ED2.0 - #SWO-0000
          Copyright 1988 College of Forestry
              Oregon State University

Enter tree data file name [NO extension
 (i.e. A:MYFILE) ] ---> PLOT278
Enter output file name ---> OUT278
FILE 'OUT278' EXISTS!
OVERWRITE? (Y) ---> <CR>
```

ORGANON Program Defaults and Specifications

Twenty program variables form a parameter list that affects how ORGANON runs. ORGANON has a default value for each of these variables which can be used any time ORGANON runs (1 - System Defaults). You also have the option of defining and saving your own set of defaults for these variables (3 - Create 'ORGANON.DEF"). You can assign these values once and use them on any future ORGANON runs (2 - Use Default file 'ORGANON.DEF"). You may select the system defaults at any time. When prompted, select either the system defaults, your own previously defined defaults, or create your own new defaults. To create your own defaults, ORGANON starts with the set of system defaults and you modify these as desired. At the start of each program run, you may modify either system or user parameters. The parameter set selected remains active for only one ORGANON run.

```
              [DEFAULT INPUT SELECTION]

    1 - Use System Defaults
    2 - Use Default file 'ORGANON.DEF'
    3 - Create 'ORGANON.DEF'

          [<CR> = Use System Defaults]
INPUT ---> 1
```

A listing of ORGANON parameters and defaults follows.

1. Run Defaults

a. Tripling

Tripling is designed to increase the sample size of the tree data set during a growth cycle. Tripling will continue during each growth cycle until the number of sample trees reaches the maximum specified. Use of tripling causes more realistic projections of stand development through the use of stochastic elements added to the predictions. ORGANON execution time increases due to the added time needed to process each of the additional sample trees. The default for this parameter is 'NO' (tripling will not occur).

b. Maximum Tree Samples

When you select tripling, there must be a limit on the number of sample trees that are generated from the input tree file. You can set this value anywhere between a minimum of 500 trees to a maximum of 2000 trees. The greater the number of trees, however, the longer the model execution time. The default value is 500 trees. Because of the tripling process used, the actual number of sample trees resulting from tripling is probably less than the specified maximum.

c. Menu Display

To assist you when running ORGANON, the model provides user friendly menus. After several runs, these menus may no longer be necessary and may slow more experienced users. You can eliminate these menu displays by selecting 'NO' on the menu display. Even with the menus off, a brief prompt (i.e., MANAGE --->) displays to indicate the type of input requested. If you are still uncertain about input choices, enter 'HELP' or '?' -- ORGANON will display the full menu. Execution time is slightly quicker when full menus are not displayed on the screen. The default for this parameter is 'YES' (display menus).

d. Height Calibration

When a data file is initially entered into ORGANON, height calibrations are calculated for each species. If you choose 'YES', the height calibration ratios modify the equations for use in growth predictions for hardwoods and Western Hemlock. If the calibrations were determined from actual tree measurement inputs, the growth models are calibrated for the specific stand. The default for this parameter is 'YES' (use calibrations).

e. Height-to-Crown Base Calibration

When a data file is initially entered into ORGANON, height-to-crown base calibrations are calculated for each of the species. If you choose 'YES' for this parameter, the height-to-crown base calibration ratios modify the equations for predicting change in height-to-crown base. If the calibrations were determined from actual tree measurement inputs, the growth models are calibrated for the specific stand. The default for this parameter is 'YES' (use calibrations).

f. Diameter Growth Calibration

When a data file is initially entered into ORGANON, diameter growth calibrations are calculated for each of the species. If you choose 'YES' for this parameter, the diameter growth calibration ratios modify the equations for use in diameter growth predictions. If the calibrations were determined from actual tree measurement inputs, the growth models will be calibrated for the specific stand. The system default for this parameter is 'YES' (use calibrations).

g. Limit on Maximal Basal Area

ORGANON has a mortality factor that is applied during each growth cycle. Additional mortality can be placed on a stand by using a self-thinning approach to a maximum relative density, based on numbers of trees and quadratic mean diameter. The default for this parameter is 'YES' (use limit on maximum basal area).

h. Yield Tables

Yield tables display the stand's trees per acre, basalarea, cubic foot and scribner volume by species for each five-year growth cycle. If you choose this parameter, this table is automatically calculated

and then routed to the output file during each growth cycle. If yield tables are not requested, the same information may be requested when needed by manually requesting a STOCK TABLE in RESIDUAL or CUT REPORTS. The default for this parameter is 'YES' (automatically output the yield table report).

i. Mortality Table

If you choose 'YES', ORGANON provides a Mortality Table report after any growth cycle(s). The table displays the mortality rate in trees/acre, basal area, cubic foot and scribner volume that occurred during the last total growth period (one or more cycles) for each diameter class. The default for this parameter is 'NO' (the Mortality Table is not displayed).

j. Printer Form Feed

This parameter determines whether there is a form feed (new page) in the output file prior to each report requested. If you do not choose printer form feed, each report may not necessarily start at the top of a new page when printed on the line printer. The default is 'YES' (provide a new page before each report).

k. Graphics Printer

This parameter designates whether the printer used for listing tables and plots can print the IBM extended graphics character set. Selecting 'YES' causes the printer to display the same characters as displayed on the screen. Selecting 'NO' substitutes the extended graphics characters with other printable characters. If you are unsure of your printer's capabilities, select 'YES' first. If the printout does not look like the screen display, select the default setting 'NO'. The default is 'YES' (display IBM extended graphics character set).

l. Volume Equations

Board Foot volumes are determined by selecting a minimum log top diameter, trim allowance, stump height, log length, and minimum log length. Cubic Foot volumes are determined by designating a conifer top diameter, hardwood top diameter and conifer stump height. (See listings 2 and 3 below for definitions). Values of this parameter can be 'OSU' or 'BLM'. The default setting is 'OSU' (use the OSU volume equations).

Selecting the OSU volume equations initializes board foot and cubic foot parameters with the following values:

BOARD FOOT	
Min. log top diameter:	6 inches
Trim allowance:	8 inches
Stump height:	0.5 feet
Log length:	32 feet
Min. log length:	8 feet

CUBIC FOOT	
Conifer top diameter:	0 inches
Hardwood top diameter:	0 inches
Conifer stump height:	0 inches

If you select the OSU volume equations, each of these parameters is displayed and may be redefined.

If you select the BLM volume equations, the following values are used in calculations and cannot be redefined.

BOARD FOOT

Min. log top diameter: 5 inches
if DBH <= 15 inches
Variable
(5.0+(0.1837)(DBH-15.0))
if DBH > 15 inches

Trim allowance:	0.3 feet
Stump height:	1.5 feet
Log length:	16 feet
Minimum log length:	4.1 feet

CUBIC FOOT
Conifer top diameter: 5 inches
if DBH <= 15 inches
Variable
(5.0+(0.1837)(DBH-15.0))
if DBH > 15 inches
Hardwood top diameter: 5 inches
if DBH <= 15 inches
Variable
(5.0+(0.1837)(DBH-15.0))
if DBH > 15 inches
Conifer stump height: 1.5 feet

2. Board Foot Defaults

a. Minimum Board Foot Log Top Diameter

This parameter specifies the top inside bark diameter in inches to be used during board foot calculations of volumes for tables and plots. If you select the OSU volume equations, you can choose any minimum top diameter.

b. Board Foot Trim Allowance

This parameter specifies the amount of log-end trim in inches to be used during board foot calculations of volumes for tables and plots. If you select the OSU volume equations, you can choose any top diameter.

c. Board Foot Stump Height

This specifies the stump height in feet to be used during board foot calculations of volumes for tables and plots. If you select the OSU volume equations, you can choose any stump height under 4.5 feet.

d. Board Foot Log Length

This parameter specifies the log length desired in feet to be used during board foot calculations of volumes for tables and plots. If you select the OSU volume equations, you can choose any log length.

e. Board Foot Minimum Log Length

This parameter specifies the minimum log length acceptable in feet to be used during board foot calculations of volumes for tables and plots. If you select the OSU volume equations, you can choose any minimum log length.

3. Cubic Foot Defaults

a. Cubic Foot Conifer Top Diameter

This parameter specifies the top inside bark diameter in inches for conifers to be used during cubic foot calculations of volumes for tables and plots. If you select the OSU volume equations, you can choose any value of cubic foot top diameter between 0 and 6 inches.

b. Cubic Foot Hardwood Top Diameter

This parameter specifies the top inside bark diameter in inches for hardwoods to be used during cubic foot calculations of volumes for tables and plots. If you select the OSU volume equations, the only valid responses are 0, 4 or 6 inches.

c. Cubic Foot Conifer Stump Height

This parameter specifies the stump height in feet for conifers to be used during cubic foot calculations of volumes for tables and plots. If you select the OSU volume equations, you can choose any stump height below 4.5 feet.

The following example shows the default selection menu when you choose the system defaults, and the OSU volume equations are replaced with BLM volume equations.

```
DEFAULT SELECTION SAMPLE

[ DEFAULT INPUT SELECTION ]
 1 - Use System Defaults
 2 - Use Default file 'ORGANON.DEF'
 3 - Create 'ORGANON.DEF'
      [ <CR> = Use System Defaults ]
 INPUT ---> 1

          [ RUN DEFAULTS ]
 1.                TRIPLING:  No
 2.            DISPLAY MENUS:  Yes
 3.  USE HEIGHT CALIBRATION:  Yes
 4.    USE HTCB CALIBRATION:  Yes
 5. USE DIAM. GRO CALIBRATION: Yes
 6.            LIMIT ON MAX. BA: Yes
 7.               YIELD TABLE: Yes
 8.           MORTALITY TABLE: No
 9.        PRINTER FORM FEED:  Yes
10.         GRAPHICS PRINTER:  Yes
11.        VOLUME EQUATIONS:  OSU
          [ BOARD FOOT DEFAULTS ]
12.          LOG TOP DIAM:   6  inches
13.       TRIM ALLOWANCE:   8.  inches
14.         STUMP HEIGHT:   .5  feet
15.          LOG LENGTH:  32  feet
16.       MIN LOG LENGTH:  8.0  feet
          [ CUBIC FOOT DEFAULTS ]
17.    CONIFER TOP DIAM (0.0" - 6.0"):  .0 in.
18. HARDWOOD TOP DIAM (0.0",4.0",6.0"):  .0 in.
19.              CONIFER STUMP HT:  .0 ft.
          [ <CR> to end ]
 INPUT # TO MODIFY ---> 11
          [ RUN DEFAULTS ]
 1.                TRIPLING:  No
 2.            DISPLAY MENUS:  Yes
 3.  USE HEIGHT CALIBRATION:  Yes
 4.    USE HTCB CALIBRATION:  Yes
 5. USE DIAM. GRO CALIBRATION: Yes
 6.            LIMIT ON MAX. BA: Yes
 7.               YIELD TABLE: Yes
 8.           MORTALITY TABLE: No
 9.        PRINTER FORM FEED:  Yes
10.         GRAPHICS PRINTER:  Yes
11.        VOLUME EQUATIONS:  BLM
12.         MAX SAMPLE TREES:  500
          [BLM VOLUME DEFAULTS ]
13.   BLM MINIMUM DBH (>= 6.0"):  7.0 inches
          [ <CR> to end ]
 INPUT # TO MODIFY --->

NOTE: The default selection menu will not display
item #12 (MAX SAMPLE TREES) when tripling
has not been selected.
```

To continue following the example in this manual, reset #11 (VOLUME EQUATIONS) to OSU. The following example shows how to change item nine on the default menu (PRINTER FORM FEED) from a 'YES' to a 'NO', and item twelve (BOARD FOOT LOG TOP DIAMETER) from 6.0 inches to 4.0 inches.

```
DEFAULT SELECTION EXAMPLE

          [ RUN DEFAULTS ]
 1.                TRIPLING:  No
 2.            DISPLAY MENUS:  Yes
 3.  USE HEIGHT CALIBRATION:  Yes
 4.    USE HTCB CALIBRATION:  Yes
 5. USE DIAM. GRO CALIBRATION: Yes
 6.            LIMIT ON MAX. BA: Yes
 7.               YIELD TABLE: Yes
 8.           MORTALITY TABLE: No
 9.        PRINTER FORM FEED:  Yes
10.         GRAPHICS PRINTER:  Yes
11.        VOLUME EQUATIONS:  OSU
          [ BOARD FOOT DEFAULTS ]
12.          LOG TOP DIAM:   6  inches
13.       TRIM ALLOWANCE:   8.  inches
14.         STUMP HEIGHT:   .5  feet
15.          LOG LENGTH:  32  feet
16.       MIN LOG LENGTH:  8.0  feet
          [ CUBIC FOOT DEFAULTS ]
17.    CONIFER TOP DIAM (0.0" - 6.0"):  .0 in.
18. HARDWOOD TOP DIAM (0.0",4.0",6.0"):  .0 in.
19.              CONIFER STUMP HT:  .0 ft.

              [ <CR> to end ]

 INPUT # TO MODIFY ---> 9

              (continued)
```

DEFAULT SELECTION EXAMPLE (continued)

```
          [ RUN DEFAULTS ]
 1.                  TRIPLING:  No
 2.              DISPLAY MENUS:  Yes
 3.  USE HEIGHT CALIBRATION:  Yes
 4.    USE HTCB CALIBRATION:  Yes
 5. USE DIAM. GRO CALIBRATION: Yes
 6.              LIMIT ON MAX. BA: Yes
 7.                YIELD TABLE: Yes
 8.           MORTALITY TABLE: No
 9.         PRINTER FORM FEED: No
10.          GRAPHICS PRINTER: Yes
11.          VOLUME EQUATIONS: OSU
        [ BOARD FOOT DEFAULTS ]
12.            LOG TOP DIAM:  6  inches
13.         TRIM ALLOWANCE:  8.  inches
14.           STUMP HEIGHT:  .5  feet
15.             LOG LENGTH:  32  feet
16.         MIN LOG LENGTH:  8.0  feet
        [ CUBIC FOOT DEFAULTS ]
17.      CONIFER TOP DIAM (0.0" - 6.0"):  .0 in.
18. HARDWOOD TOP DIAM (0.0",4.0",6.0"):  .0 in.
19.                CONIFER STUMP HT:  .0 ft.
          [ <CR> to end ]
 INPUT # TO MODIFY ---> 12
 Enter inches ---> 4

          [ RUN DEFAULTS ]
 1.                  TRIPLING:  No
 2.              DISPLAY MENUS:  Yes
 3.  USE HEIGHT CALIBRATION:  Yes
 4.    USE HTCB CALIBRATION:  Yes
 5. USE DIAM. GRO CALIBRATION: Yes
 6.              LIMIT ON MAX. BA: Yes
 7.                YIELD TABLE: Yes
 8.           MORTALITY TABLE: No
 9.         PRINTER FORM FEED: No
10.          GRAPHICS PRINTER: Yes
11.          VOLUME EQUATIONS: OSU
        [ BOARD FOOT DEFAULTS ]
12.            LOG TOP DIAM:  4  inches
13.         TRIM ALLOWANCE:  8.  inches
14.           STUMP HEIGHT:  .5  feet
15.             LOG LENGTH:  32  feet
16.         MIN LOG LENGTH:  8.0  feet
        [ CUBIC FOOT DEFAULTS ]
17.      CONIFER TOP DIAM (0.0" - 6.0"):  .0 in.
18. HARDWOOD TOP DIAM (0.0",4.0",6.0"):  .0 in.
19.                CONIFER STUMP HT:  .0 ft.
          [ <CR> to end ]

 INPUT # TO MODIFY ---> <CR>
 Default values are now set.
```

Execution Suggestions

The following tips will make execution of the ORGANON model faster and simpler.

1. In most cases, when ORGANON prompts you for a response, a response appears in parentheses after the prompt. This response is ORGANON's default response should you press a carriage return (<CR>). The values of the default responses (carriage returns) were selected by ORGANON's authors as the most frequently expected responses. Running ORGANON with default responses reduces user keyboard entries and speeds program execution.

2. Whenever ORGANON prompts you for a YES or NO response, entering 'Y', 'y', 'YES', or 'yes' 'are all acceptable values for yes. The values N', 'n', 'NO' or 'no' are acceptable values for no.

3. Any response may be entered in all capital letters or all small letters. ORGANON is not case sensitive.

4. When menus are not displayed, you may request them at anytime by entering '?' or 'HELP' when prompted.

5. When a number of reports must be printed, ORGANON runs faster if all report output is to a file only, or to the screen and a file. After program execution, use the MS-DOS 'PRINT' command to print reports in the output file. You may edit the output file with a word processor to eliminate all but the required reports.

6. You should send plots and tables to an output file as well as to the screen. The output file describes the stand and contains all defaults and parameters associated with the stand's requested reports and tables. In addi-

tion, ORGANON's run history attached to the end of the output file contains a listing of the management decisions and growth cycles in a management scenario.

Master Menu Options

After data are entered, edited, and checked (including selecting defaults), ORGANON comes under the control of the master menu. At that point, ORGANON becomes a 'user-directed' program. This means that a main menu is displayed and you, the user, must select one of five program options (REPORTS, GROWTH, MANAGEMENT, RESTART, QUIT). After you select a run option, ORGANON processes your input and displays the main menu, prompting you to select another run option. The following are all selections that may appear on the main menu. Some selections are only available at certain points during program execution while others are available at all times.

MASTER MENU EXAMPLE

[MASTER MENU]

Organon

RR - Residual Tables and Plots

GR - Execute Model
(perform 5-yr growth cycle)

MT - Management Scheme
(test or perform management)

RS - Restart Program
(begin with data input)

[QUIT - Stop Program]

ORGANON --->

1. Residual Tables and Plots (RR)

Residual Reports are available at any time on the main menu except immediately following management. Residual Reports display the current residual stand statistics. Residual Reports available within the Management Menu reflect the stand prior to any cut requests (See TRIAL VS ACCEPTED MANAGEMENT). The following example shows the reports and plots available from the Residual Report Menu.

RESIDUAL TABLES AND PLOTS EXAMPLE

[RESIDUAL TABLES AND PLOTS]

[Tables]

TL-Sample Tree List	SS-Sample Summary
ST-Per Acre Stand Table	SK-Stocking Table
LG-Log Table	DF- Display Defaults
RH-Run History	MO-Mortality Table

[Plots]

PAH - Height	PAC - Crown Ratio
PCV - CF Volume	PSV - Scribner Volume
PDG - Diam Growth	PHG - Height Growth
PCG - CF Vol Grow.	PSG - Scrib.Vol. Grow.

AVG PER = TREE

PDF - Dia. Freq.	PVC - CF Volume
PBA - Basal Area	PVS - Scribner Vol.

PER = END

PFC - Dia. Freq.	PGC - CF Volume
PAB - Basal Area	PGS - Scribner Vol.

ACRE = CHG

[<CR> - Return to Master Menu]

RESIDUAL REPORTS --->

NOTE: The MO (Mortality Table) and all per acre change reports (PFC,PAB, PGC, PAB, and PGS) will not be available on the Residual Report Menu until after a growth cycle.

a. Sample Tree List (TL)

The Sample Tree List Report is a listing of the status of the input sample trees. The header provides the stand identification, age, total stand basal area, number of sample trees and species group. When displaying large sample stands, you may request a report to display the list with a skip factor (i.e., every other tree, every fifth tree, etc.). This allows you to quickly inspect very large data files.

ORGANON displays most items from the sample tree list in the same format as initially entered. However, species, expansion factor and radial growth have been transformed to a form compatible with the growth model. ORGANON changes input species code numbers to alpha codes for ease of reading. ORGANON changes expansion factors to a per acre basis (divided by number of plots/points). ORGANON changes radial growth, if entered, to diameter growth. The following table shows an initial Sample Tree List.

SAMPLE TREE LIST EXAMPLE

TEST PLOT278 [11-24-88 8:46 AM] Page 1
TREE LIST TOTAL 36 YRS
FOR ALL SPECIES -- SKIP=1
TOTAL SAMPLE TREES = 12
TOTAL STAND BASAL AREA = 65.8

tree	sp	dbh	ht	cr	exp	+ht	+d	uc
1	DF	7.8	43.3	.73	14.32	.0	.00	0
2	DF	11.1	45.9	.94	7.44	.0	.00	0
3	DF	9.0	40.2	.89	11.32	.0	.00	0
4	DF	11.1	54.3	.99	7.44	.0	.00	0
5	DF	4.9	35.6	.98	14.32	.0	.00	0
6	DF	3.3	21.9	.86	57.27	.0	.00	0
7	DF	3.0	19.8	.85	57.27	.0	.00	0
8	DF	10.4	45.0	.88	8.48	.0	.00	0
9	DF	9.8	46.6	.91	9.55	.0	.00	0
10	DF	11.6	58.3	.95	6.81	.0	.00	0
11	DF	4.1	31.2	.89	14.32	.0	.00	0
12	DF	7.6	43.6	.92	14.32	.0	.00	0

b. Sample Summary Table (SS)

The Sample Summary Table provides a condensed version of the Sample Tree List averaged by 2-inch diameter class. This information is averaged sample data -- NOT per acre values! The table also displays cubic foot and scribner volume, and cubic foot and scribner volume growth for the average tree in each diameter class. Values for each diameter class displayed in the Sample Summary Table include the upper diameter, but not the lower diameter. The following example shows an initial Sample Summary Table.

SAMPLE SUMMARY TABLE EXAMPLE

TEST PLOT278 [11-24-88 8:46 AM] Page 1
INITIAL SAMPLE SUMMARY TABLE
AT 36 YEARS FOR ALL SPECIES

TABLE GROWTH FOR THE PREVIOUS 0 YEARS

AVERAGE PER TREE

diam class	dbh	ht	dia cr	ht grow	cf grow	cf volgrow	Scrib vol	Scrib grow
0 - 2"	.2	5.2	.87	.00	.00	.0	.0	0.	0.
2 - 4"	3.4	21.1	.91	.00	.00	.6	.0	0.	0.
4 - 6"	4.6	32.6	.89	.00	.00	1.6	.0	0.	0.
6 - 8"	7.2	41.2	.86	.00	.00	4.6	.0	13.	0.
8 -10"	9.4	43.4	.90	.00	.00	7.7	.0	17.	0.
10 -12"	11.0	50.9	.94	.00	.00	12.1	.0	24.	0.

c. Per Acre Stand Table (ST)

The Stand Table provides per acre values for number of trees, basal area, cubic foot volume, scribner volume and changes to these values by 2-inch diameter class. If you choose to display all species (AL), the number of trees, basal area, and cubic foot volume are calculated for all species. Scribner volume is calculated for conifer species only. The change values reflect movement from one class to another, mortality, and growth. The following exam-

ples show an Initial Stand Table and a Stand Table after 5 year's growth (1 growth cycle).

INITIAL PER ACRE STAND TABLE EXAMPLE

TEST PLOT278 [11-24-88 8:46 AM] Page 1
INITIAL PER ACRE STAND TABLE
AT 36 YEARS FOR ALL SPECIES

	ENDING				NET 0-YR CHANGE			
diam class	trees/ acre	ba	cf vol	Scrib vol	trees/ acre	ba	cf vol	Scrib vol
0 - 2"	57.3	.0	0.	0.				
2 - 4"	229.1	15.0	142.	0.				
4 - 6"	71.6	8.4	112.	0.				
6 - 8"	43.0	12.4	197.	571.				
8 -10"	20.9	10.0	158.	357.				
10 -12"	30.2	20.0	362.	701.				
Totals	451.9	65.8	970.	1628.				

PER ACRE STAND TABLE EXAMPLE

PLOT278 [11-24-88 8:47 AM] Page 1
INITIAL PER ACRE STAND TABLE
AT 41 YEARS FOR ALL SPECIES

	ENDING				NET 0-YR CHANGE			
diam class	trees/ acre	ba	cf vol	Scrib vol	trees/ acre	ba	cf vol	Scrib vol
0 - 2"	56.9	.1	1.	0.	-.4	.1	1.	0.
2 - 4"	.0	.0	0.	0.	-229.6	-15.0	-142.	0.
4 - 6"	271.2	36.6	493.	782.	199.6	28.2	381.	782.
6 - 8"	28.6	6.9	117.	367.	-14.4	-5.4	-80.	-204.
8 -10"	42.9	18.5	365.	860.	22.0	8.5	207.	503.
10 -12"	20.8	14.4	282.	571.	-9.3	-5.6	-79.	-129.
12 -14"	30.2	28.3	615.	1519	30.2	28.3	615.	1519.
Totals	450.6	104.	1873.	4099.	-1.3	39.	1903.	2470.

d. Stocking Table (SK)

The Stocking Table provides the same per acre values displayed in the stand table, only summarized by species group. Additionally, this table provides Reineke's (1933) stand density index, Southwest Oregon relative density index (Hann and Wang), quadratic mean diameter, mean height, diameter and crown ratio for all trees greater than 45 feet in height. The following examples show an initial Stocking Table and a Stocking Table after 5 year's growth (1 growth cycle).

INITIAL RESIDUAL STOCKING TABLE EXAMPLE
RESIDUAL STOCK TABLE

TEST PLOT278
DATA FILE: PLOT278 [11-24-88 8:46 AM]

at spec. yr	ENDING trees/ acre	ba	cf vol	Scrib vol	0-YR CHANGE trees/ acre	ba	cf vol	Scrib vol
DF 36	451.9	65.8	970.	1628.				
	451.9	65.8	970.	1628.				

Stand Density Index: 157.
Relative Density Index: .295
Quadratic Mean Diameter: 5.2
Mean Height: 25.8
Mean Diameter: 4.4
Mean Crown Ratio: .899

RESIDUAL STOCKING TABLE EXAMPLE
RESIDUAL STOCK TABLE

TEST PLOT278
DATA FILE: PLOT278 [11-24-88 8:46 AM]

at spec. yr	ENDING trees/ acre	ba	cf vol	Scrib vol	0-YR CHANGE trees/ acre	ba	cf vol	Scrib vol
DF 41	450.6	104.9	1873	4099.	-1.3	39.1	902.8	2470.
	450.6	104.9	1873	4099.	-1.3	39.1	902.8	2470.

Stand Density Index: 228.
Relative Density Index: .429
Quadratic Mean Diameter: 56.5
Mean Height: 35.4
Mean Diameter: 5.7
Mean Crown Ratio: .783

e. Log Table (LG)

The Residual Log Table provides a gross standing log inventory based on the log parameters selected in the default menu. All conifer trees are divided into logs and then the logs are tallied by species group and top diameter. Volumes for each log are computed using the Columbia Bureau Scribner Log Factors. Also given are a set of totals by species, where average volume is calculated by dividing the total volume by the total number of logs. Values for each diameter class displayed in the Stand Table include the upper diameter, but not the lower diameter. The following example shows a Residual Log Table.

RESIDUAL LOG TABLE EXAMPLE

RESIDUAL LOG TABLE (TOTAL 36 YEARS)

TEST PLOT278 [11-24-88 8:46 AM] Page 1
LOG LENGTH: 32 ft MIN LOG LENGTH: 8.0 ft
TOP DIAM: 4.0 in

Top Diam	DF Logs	DF Vol	G/W Fir Logs	G/W Fir Vol	P/S Pine Logs	P/S Pine Vol	OtherConifer Logs	OtherConifer Vol
4-6"	94.0	1628.2	.0	.0	.0	.0	.0	.0
Totals								
Logs:	94.0		.0		.0		.0	
Volumes:	1628.2		.0		.0		.0	
Avg.Vol.:	17.3		.0		.0		.0	

f. Mortality Table (MO)

The Mortality Table provides the per acre mortality rate in number of trees, basal area, cubic foot volume and scribner volume that occurred during the last total growth period (one or more specified cycles) for each 2" diameter class. The mortality rates for multiple cycle growth periods are the sum of the mortality rates calculated in each cycle. The diameter classes of the table are determined by the diameters at the start of each growth cycle. Likewise, basal area and volumes in mortality are based upon tree characteristics at the start of each cycle. The underlying assumption in ORGANON is that mortality trees have no growth just prior to death. This table is available only if you select 'YES' for the MORTALITY TABLE parameter.

MORTALITY TABLE EXAMPLE

TEST PLOT278 [11-24-88 8:46 AM] Page 1
MORTALITY TABLE AT 41 YEARS
FOR ALL SPECIES

5-YEAR MORTALITY RATE

diam class	trees/ acre	ba	cf vol	Scrib vol
0 - 2"	.4	.0	.0	.0
2 - 4"	.6	.0	.4	.0
4 - 6"	.2	.0	.3	.0
6 - 8"	.1	.0	.4	1.2
8 - 10"	.0	.0	.1	.3
10 - 12"	.0	.0	.1	.3
Totals	1.3	.1	1.4	1.8

g. Run History (RH)

The Run History report is available at any time (displayed on–screen only). This report contains the current status and history of the ORGANON run. This includes present stand age, current cycle and previous stand activities. If management is in progress, trial cuts are displayed (See TRIAL VS ACCEPTED MANAGEMENT). The following example shows a Run History report after previous stand growth and management.

RUN HISTORY EXAMPLE

RUN HISTORY AND STATUS
[11-24-88 8:46 AM]

TEST PLOT278
Growth Cycles Completed: 3
Breast Height Stand Age: 43
Total Stand Age: 51
Status: TRIAL MGMT

RUN HISTORY

YEAR	ACTIVITY
36	GROWTH ---> 1 CYCLE
41	THIN BA (AL) from above> 20 sq ft
41	THIN DBH (AL) 0 ">50% 75 ">50 %
41	GROWTH ---> 2 CYCLES

Trial Management in progress...

SDI THIN proportional --> Target 200

<CR> to continue...

h. Display Defaults

This selection displays the current settings for the run, and board foot and cubic foot default parameters as described in the section ORGANON PROGRAM DEFAULTS AND SPECIFICATIONS. DISPLAY DEFAULTS is only available on–screen.

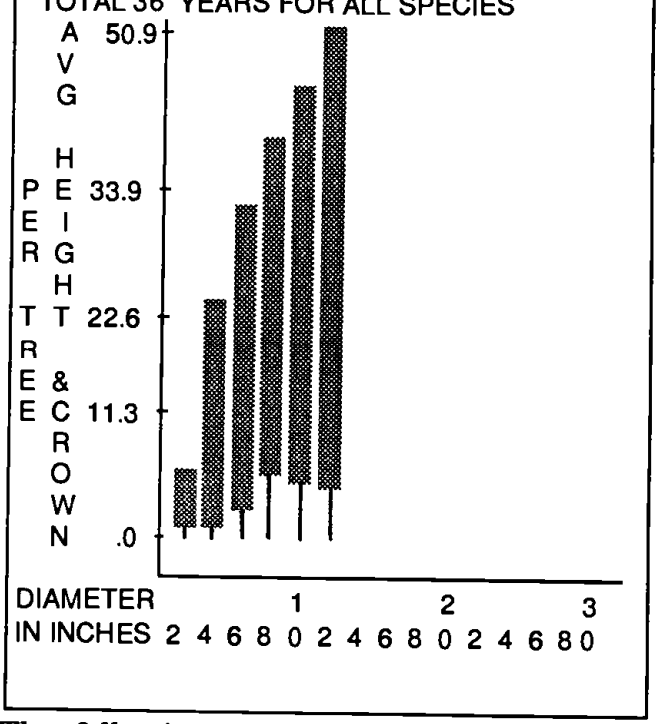
i. Average Plots

For average variables displayed in the Sample Summary Table, there is a corresponding plot of that variable by diameter class. The diameter values displayed on the X-axis indicate the upper diameter of the class (i.e., 14 represents 12" < DBH <= 14"). The following table shows the plots available associated with the Sample Summary Table.

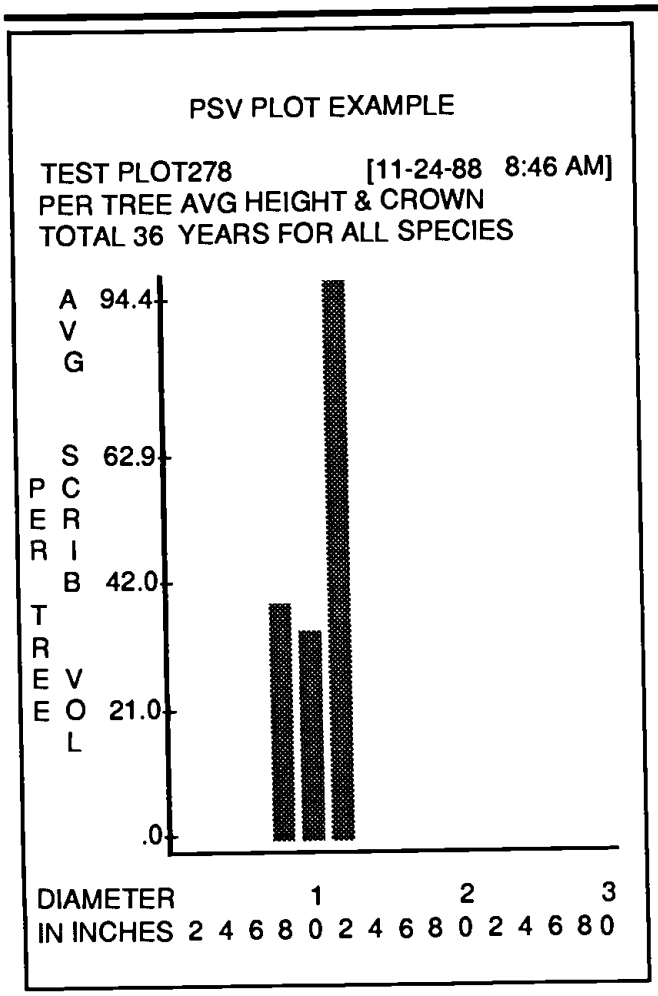
TABLE:	Residual Sample Summary
ASSOC. PLOTS:	PAH Average Height PAC Average Crown Ratio PDG Average Diameter Growth PHG Average Height Growth PCV Average Cubic Foot Volume PSV Average Scribner Volume PCG Ave. Cubic Ft. Vol. Growth PSV Ave. Scribner Vol. Growth

The following example is a PAH plot showing a stand profile by plotting average tree height and average crown base by diameter class. The 'IN' diameter indicates ingrowth trees and will only display during trial management (see MANAGEMENT INGROWTH).

PAH PLOT EXAMPLE



The following PSV plot is a histogram of average scribner volume for the trees in each diameter class.

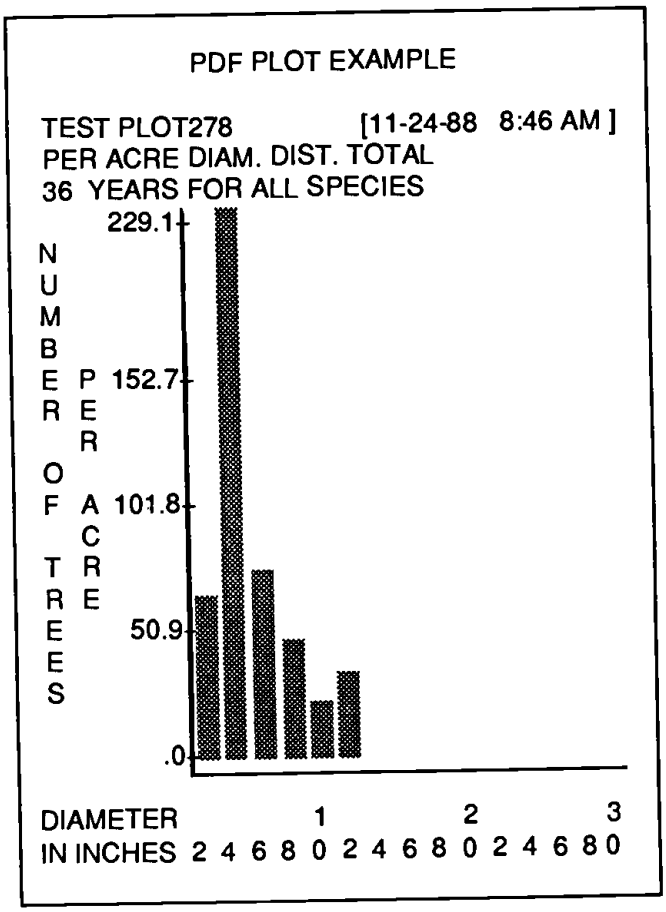


j. Per Acre Plots

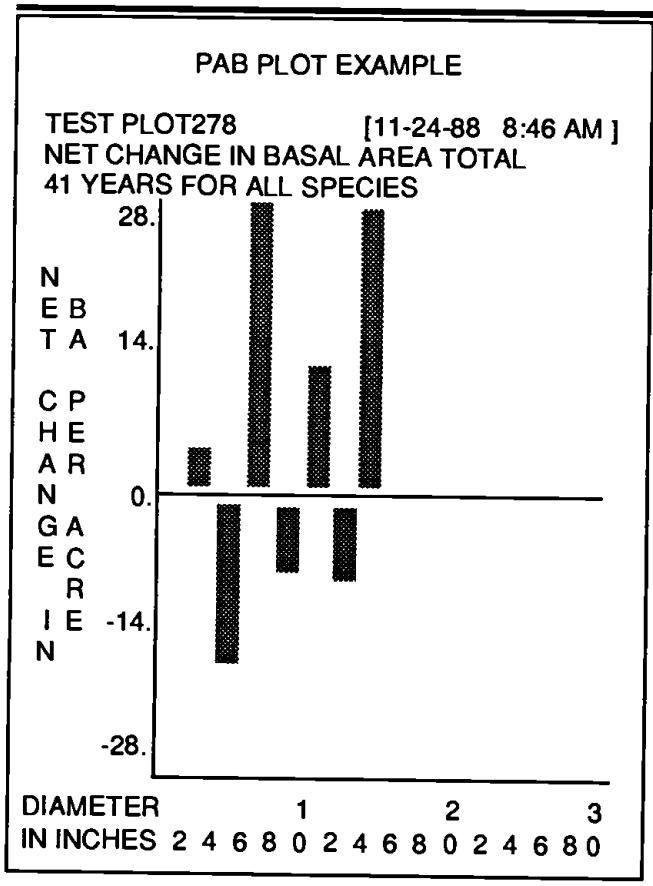
For any per acre variable displayed on the Stand Table, ORGANON can plot that variable by diameter class. The diameter values displayed on the X-axis indicate the upper diameter of the class (i.e., 14 represents 12" < DBH <= 14"). The following table shows the plots available associated with the Stand Table.

TABLE:	Residual Stand Table	
ASSOC. PLOTS:	PDF	Ending Diameter Frequency
	PVC	Ending Cubic Foot Volume
	PVS	Ending Scribner Volume
	PBA	Ending Basal Area
	PFC	Change in Diameter Frequency
	PGC	Change in Cubic Foot Volume
	PGS	Change in Scribner Volume
	PAB	Change in Basal Area

The following is a PDF plot example which is a histogram of the per acre diameter distribution.



The following example is a PAB plot which is a histogram of the per acre basal area change by diameter class for the last set of growth cycles requested.



k. Table and Plot Parameters

1. Species

Each time you select CUT or RESIDUAL REPORTS from the main menu, you must also select the species or species group to be reported. All reports (except STOCKING TABLE and YIELD TABLE which always displays Douglas–Fir, Grand/White Fir, Ponderosa Pine, Other Conifer and Hardwoods) only display the results for that species or species group. The species choices are listed below.

AL: All Species - Lumps all species listed in section SPECIES CODE NUMBER together
SP:Specific Species - One of the specific species listed in SPECIES CODE NUMBER
AC: All conifers - Lumps all trees with species codes less than or equal to 300 together
AH: All hardwoods - Lumps all trees with species codes greater than 300 together

The selected species or species group is fixed until you exit the REPORT menu. The default response (<CR>) for the species code is 'AL', ALL SPECIES. The following examples show how to select reports for display of a species group (ALL HARDWOODS), and a single species (DOUGLAS FIR).

SPECIES SELECTION EXAMPLE

Species groups:	Specific Species:	
AL-All Species	DF-Douglas Fir	GW-Grand/White Fir
AC-All Conifers	PP-Ponderosa Pine	SP-Sugar Pine
AH-All H'woods	IC-IncenseCedar	WH-W.Hemlock
	MD-Madrone	GC-Chinkapin
	TA-Tanoak	CL-Canyon Live Oak
	BL-Big Leaf Maple	WO-White Oak
	BO-Black Oak	

SPECIES OR SPECIES GROUP DESIRED (AL)> **AH**

SPECIES SELECTION EXAMPLE

Species groups:	Specific Species:	
AL-All Species	DF-Douglas Fir	GW-Grand/White Fir
AC-All Conifers	PP-Ponderosa Pine	SP-Sugar Pine
	AH-All H'woods	IC-IncenseCedar
	WH-W.Hemlock	
	MD-Madrone	GC-Chinkapin
	TA-Tanoak	CL-Canyon Live Oak
	BL-Big Leaf Maple	WO-White Oak
	BO-Black Oak	

SPECIES OR SPECIES GROUP DESIRED (AL)> **DF**

2. Destination

When you request any reports, you must also choose a destination for those tables and plots. That destination holds for every plot or table requested until you exit the report menu. When you next display the report menu, ORGANON again requests the destination for tables and plots. Destination choices for tables and plots can include any in the following list.

FO - Previously specified output file only
SO - Screen only
PO - Printer only
SF - Screen and file
AL - All destinations (screen, file and printer)

The default response for a destination is 'SO', SCREEN ONLY. The following example chooses a report destination of 'FO', FILE ONLY. The report does not display on the screen, but is only written to the output file (OUT278 in this case) that you selected at the start of the ORGANON run.

DESTINATION SELECTION EXAMPLE

Would you like these reports displayed on:

SO - Screen Only
PO - Printer Only
FO - File: OUT278
SF - Screen and File: OUT278
AL - All - Screen, Printer and File: OUT278

DISPLAY (SO) ---> **FO**

3. Windows

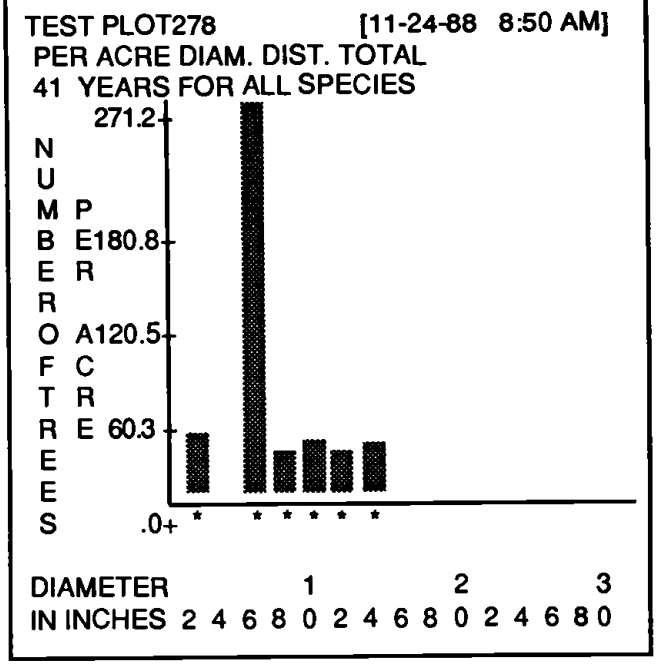
You can request a window for any plot selected. The window determines the 2" diameter classes to be included in the display. The default response for windows is 'N' (NO window selection), which displays the entire diameter class scale from 0" to 36". If a window is desired, a 'Y' response requires input of an even number minimum and maximum (within the 0"-36" limit) diameter class to be displayed. Values for all diameter classes outside the specified window are not displayed. Window selection forces a rescaling of the Y-axis values of the plot and results in a more accurate display of the requested diameter classes. This feature is particularly useful when one (or several) diameter class(es) has a very large value compared to the other diameter classes in the plot. As a result, the other classes may appear to have the same value. By using the window option, very large value(s) can be eliminated from the plot. This allows you to inspect the remaining classes in more detail. If you select a window to plot, a description below the diameter class X-axis indicates the range requested. This description will appear on plots to all destinations except the screen.

Under no circumstances are diameter classes greater than 36" displayed. A message appears identifying the number of trees greater than 36" in diameter that do not appear on the plot.

ORGANON prompts you for window selection input each time you request a plot. Windowing gives you multiple views of the same plot. An example of a screen display of diameter class windows follows.

WINDOW SELECTION EXAMPLE

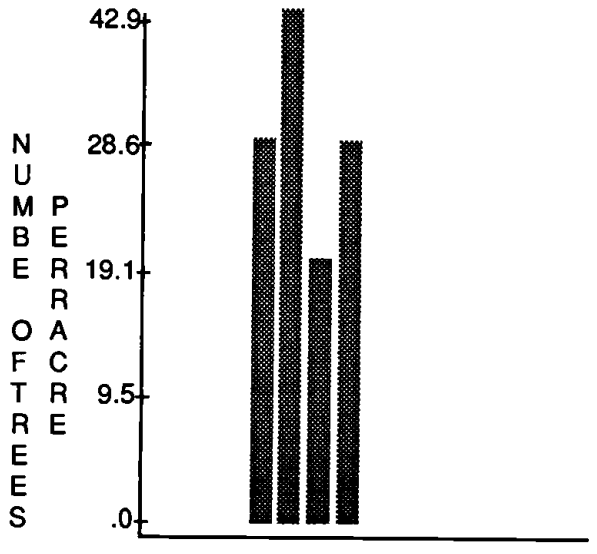
RESIDUAL REPORTS ---> **PDF**
Window ? (N) ---> **<CR>**



WINDOW SELECTION EXAMPLE (continued)

RESIDUAL REPORTS ---> **PDF**
Window ? (N) ---> **Y**
Enter even integer diameter classes
between 2 and 36...
Min ---> **8**
Max ---> **14**

TEST PLOT278 [11-24-88 8:50 AM]
PER ACRE DIAM. DIST. TOTAL
41 YEARS FOR ALL SPECIES



NOTE: Window designation at bottom of example will not display on screen output.

2. Cut Tables and Plots (CR)

Cut Reports are only available on the main menu immediately following a management cut. Cut Reports are also available within the Management Menu and reflect any cuts currently requested whether or not those cuts have been accepted (See TRIAL VS ACCEPTED MANAGEMENT). All cut tables and plots except the Cut Log Table show both residuals and removals in one table or plot. The Cut Log Table is a log table of the cut trees only.

The following example shows the reports and plots available from the CUT MENU.

CUT TABLES AND PLOTS EXAMPLE

[CUT AND PLOTS]
[Per Acre Tables]

ST - Per Acre Stand Table
SK - Stocking Table
LG - Log Table
DF - Display Defaults
RH - Run History

[Residual/Cut Plots]

CDF-Diameter Frequency CVC-CF Volume
CBA-Basal Area CVS-Scribner Volume

[<CR> - Return to Master Menu]

CUT REPORTS --->

The Cut Stand Table is somewhat similar to the Residual Stand Table. The difference is that the left side of the Cut Stand Table is labeled 'RESIDUAL', and provides by 2" diameter class, the number of trees, basal area, cubic foot volume and scribner volume per acre for the stand after cutting. The right side of the Cut Stand Table, labeled 'REMOVAL', provides the same information as the left for the cut trees. Values for each diameter class displayed in the tables include the upper diameter but not the lower diameter. The following is an example of a Cut Stand Table after performing a basal area thin of 20 sq. ft. from above (See BASAL AREA THIN).

CUT STAND TABLE EXAMPLE

TEST PLOT278 [11-24-88 8:49 AM] Page 1
POST CUT PER ACRE STAND TABLE
AT 41 YEARS FOR ALL SPECIES

diam class	RESIDUAL trees/ acre	ba	cf vol	Scrib vol	REMOVAL trees/ acre	ba	cf vol	Scrib vol
0 - 2"	56.9	.1	1.	0.	.0	.0	0.	0.
2 - 4"	.0	.0	0.	0.	.0	.0	0.	0.
4 - 6"	271.2	8.4	112.	0.	.0	.0	0.	0.
6 - 8"	28.6	6.9	117.	367.	.0	.0	0.	0.
8 -10"	42.9	18.5	365.	860.	.0	.0	0.	0.
10 -12"	20.8	14.4	282.	571.	.0	.0	0.	0.
12 -14"	9.8	8.3	164.	336.	20.4	20.0	450.	1183.
Totals	430.2	84.9	1423.	2916.	20.4	20.0	450.	1183.

The Cut Stocking Table is similar to the Residual Stocking Table, except that the left side of the Cut Stocking Table is labeled 'RESIDUAL'. The Cut Stocking Table provides by species group, the number of trees, basal area, cubic foot volume and scribner volume per acre for the stand after cutting. The right side of the table, labeled 'REMOVAL', provides the same information as the left for the cut trees. The following is an example of a Cut Stocking Table.

CUT STOCKING TABLE EXAMPLE
POST (CUT) S T O C K T A B L E

TEST PLOT278
DATA FILE: PLOT278 [11-24-88 8:50 AM]

at: spec. yr:	RESIDUAL trees/ acre	ba	cf vol	Scrib vol	REMOVAL trees/ acre	ba	cf vol	Scrib vol
DF 41	430.2	84.9	1423.	2916.	20.4	20.0	450.4	1183.0
Totals	430.2	84.9	1423.	2916.	20.4	20.0	450.4	1183.0

Stand Density Index: 190.
Relative Density Index: .359
Quadratic Mean Diameter: 6.0
Mean Height: 34.0
Mean Diameter: 5.3
Mean Crown Ratio: .778

The Cut Log Table provides the same information as the Residual Log Table except for cut trees. Values for each diameter class displayed in the tables include the upper diameter but not the lower diameter. The following is an example of a Cut Log Table.

CUT LOG TABLE EXAMPLE
CUT LOG TABLE (TOTAL 41 YEARS)

TEST PLOT278 [11-24-88 8:40 AM] Page 1
LOG LENGTH: 32 ft MIN LOG LENGTH: 8.0 ft
TOP DIAM: 4.0 in

Top Diam	DF Logs	DF Vol	G/W Fir Logs	G/W Fir Vol	P/S Pine Logs	P/S Pine Vol	OtherConifer Logs	OtherConifer Vol
4-6"	20.4	362.3	.0	.0	.0	.0	.0	.0
6-8"	14.2	820.7	.0	.0	.0	.0	.0	.0
Totals								
Logs:		34.6		.0		.0		.0
Volumes:		1183.0		.0		.0		.0
Avg.Vol.:		34.2		.0		.0		.0

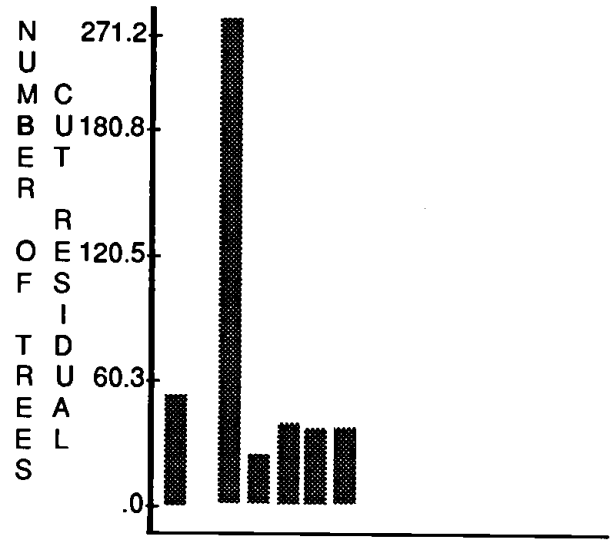
The Run History and Display Defaults on the CUT MENU are the same as the Run History on the RESIDUAL MENU.

The following two cut histograms, Diameter Frequency (CDF) and Scribner Volume (CVS), show the same total amount in each diameter class as the corresponding residual histogram. The two plotting symbols distinguish between the after-cut residual on the bottom and the cut portion on the top. The diameter values displayed on the X-axis indicate the upper diameter of the class (i.e., 14 represents 12" < DBH <= 14").

CDF PLOT EXAMPLE

TEST PLOT278 [11-24-88 8:51 AM]

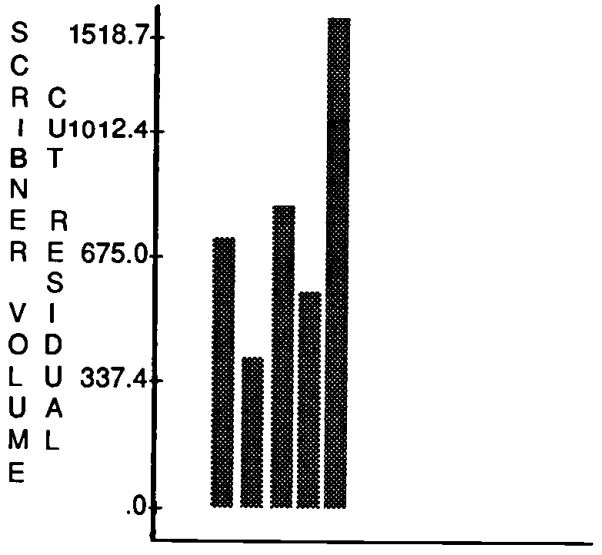
CUT/RESIDUAL PER ACRE DIAM. DIST. TOTAL
41 YEARS FOR ALL SPECIES



CVS PLOT EXAMPLE

TEST PLOT278 [11-24-88 8:42 AM]

CUT/RESIDUAL PER ACRE DIAM. DIST. TOTAL
41 YEARS FOR ALL SPECIES



3. Growth (GR)

a. Growth Cycles

GROWTH CYCLES are conducted in five-year cycles. In a growth cycle, tree height growth, diameter growth, mortality, and crown change all take place. If requested, tripling and yield table output can also be done. You can choose any number of growth cycles, as long as the total number does not exceed the growth cycle limits. REPORTS and MANAGEMENT are only available after completion of the number of growth cycles requested. Because they are automatic and not user-selected, yield tables are the only tables available at each growth cycle regardless of the number of growth cycles that you request. After all growth cycles selected are complete, ORGANON displays all main menu options. The following is an example where the stand is grown for three cycles.

GROWTH CYCLE EXAMPLE

```
ORGANON ---> GR
Number of 5-year cycles to execute? (1) --->3
          [ execution beginning ]
[please wait yield table values are being calculated]

  *** START CYCLE       1
   CYCLE 1 -- COMPUTATION ENDS WITH  5
   YEARS TOTAL STAND GROWTH
[please wait yield table values are being calculated]
  *** END OF CYCLE      1

  *** START CYCLE       2
   CYCLE 2 -- COMPUTATION ENDS WITH 10
   YEARS TOTAL STAND GROWTH
[please wait yield table values are being calculated]
  *** END OF CYCLE      2

  *** START CYCLE       3
   CYCLE 3 -- COMPUTATION ENDS WITH 15
   YEARS TOTAL STAND GROWTH
[please wait yield table values are being calculated]
  *** END OF CYCLE      3

 ORGANON --->
```

b. Growth Cycle Limits

For uneven age stands, a maximum of 22 cycles or 110 years of growth can be requested. For even age stands, the number of cycles is limited by the starting stand age such that the ending stand age does not exceed 125 years at breast-height. The stand also cannot be further grown when more than 50% of the major species in the stand (Douglas Fir, True Fir, Incense Cedar, Ponderosa Pine and Sugar Pine) reach a growth effective age of 120 breast-height years. However, MANAGEMENT, RESIDUAL or CUT REPORTS, and FERTILIZATION may still be selected from the main menu. Finally, no growth can occur after the stand has been FINAL HARVESTED.

GROWTH CYCLE LIMITS EXAMPLE

ORGANON ---> **GR**
Number of 5-year cycles to execute? (1) ---> **19**

NUMBER OF CYCLES REQUESTED
WILL CAUSE STAND AGE TO EXCEED
MAX STAND AGE
ONLY 16 CYCLES WILL BE RUN

GROWTH CYCLE LIMITS EXAMPLE

ORGANON ---> **GR**
Number of 5-year cycles to execute? (1) ---> **20**

NUMBER OF CYCLES REQUESTED
WILL CAUSE STAND AGE TO EXCEED
MAX STAND AGE
ONLY 19 CYCLES WILL BE RUN

GROWTH CYCLE LIMITS EXAMPLE

ORGANON ---> **GR**
Number of 5-year cycles to execute? (1) ---> **2**

*** NO GROWTH CYCLES POSSIBLE ---
NO REMAINING MAJOR SPECIES

GROWTH CYCLE LIMITS EXAMPLE

ORGANON ---> **GR**
Number of 5-year cycles to execute? (1) ---> **5**

*** START CYCLE 10

CYCLE 10 -- COMPUTATION ENDS WITH 50 YEARS TOTAL STAND GROWTH

[please wait yield table values are being calculated]

*** END OF CYCLE 10

*** 39.5% OF THE MAJOR SPECIES TREES ARE OVER 120 YEARS

*** START CYCLE 11

CYCLE 11 -- COMPUTATION ENDS WITH 15 YEARS TOTAL STAND GROWTH

[please wait yield table values are being calculated]

*** END OF CYCLE 11

*** 51.2% OF THE MAJOR SPECIES TREES ARE OVER 120 YEARS

*** GROWTH TERMINATED -- MORE THAN 50% OF MAJOR SPECIES TREES OVER 120 YEARS.

ORGANON --->

NOTE: The preceding examples do not necessarily reflect messages given for example TEST PLOT278.

4. Management (MT)

The management routines let you select, view and execute a management scheme of thinning, fertilization and harvesting. A display of the Management Menu follows.

MANAGEMENT MENU EXAMPLE

[MANAGEMENT MENU]
[Selection]
FE - Fertilize
FH - Final Harvest
IN - Ingrowth

[Thin]
DB - Diameter BA - Basal Area
DI - Stand Density US - User Code

[Reports]
RR - Residual
CR - Cut

[Restart]
RS - Restart Management Selection

[Exit]
PM - Perform Management and Exit
VM - Void Management and Exit

MANAGE --->

a. Thin

There are several approaches you can use to thin a stand. You can use any combination of these thinning methods to obtain the desired results. All thinning operations are reflected on YIELD TABLES, if requested, and on CUMULATIVE CUT LOG TABLES. After you select each thinning operation, you can change your mind and not thin the stand if you so choose. ORGANON lets you cancel your action and returns you to the main menu.

Thinnings are accomplished within ORGANON by reducing the expansion factors of the trees affected. As an example, a Diameter Proportional thinning is accomplished by reducing the expansion factors of all trees by the fractional value (a constant) needed to meet the user-specified goal. Thinning from above (or below) starts with the largest (or smallest) diameter and sets it and each succeeding smaller (or larger) tree to zero until doing so to the next smaller (larger) tree would remove too many trees per acre. A fractional part of that tree's expansion is then removed to meet your desired goal.

1. Diameter Thin (DB)

You can choose a diameter thin to thin by diameter class. ORGANON prompts you for the following information:

Species - The species or species group to which the thinning will be applied.

Lower DBH - The smallest diameter for the thinning. This diameter will NOT be included in the thinning.

Percent removal - The percent to remove at the lower diameter.

Upper DBH - The largest diameter for the thinning. This diameter WILL be included in the thinning.

Percent removal - The percent to remove at the largest diameter.

The removal percentages for diameters between the smallest and largest diameters are determined by linear interpolation. The formula for this interpolation is:

$$P = [(Di - DL)/(DU - DL)] [PU - PL] + PL$$

Where,

Pi = Percent removal for an interim diameter
Di = The interim diameter
DU = The largest diameter
DL = The smallest diameter
PU = Percent removal for the largest diameter
PL = Percent removal for the smallest diameter.

In the following example, a thin of 50% from 2.5" trees linearly decreasing to 10% from 28" trees is performed on the DOUGLAS FIR in the stand.

```
DIAMETER CLASS THIN EXAMPLE

MANAGE ---> DB

SPECIES OR SPECIES GROUP DESIRED
(AL) ---> DF

[ *** WARNING *** ]

Lower DBH value 'not' included...
Upper DBH value included...
(i.e. lower < CUT <= upper)

Enter lower DBH ---> 2.5
Enter lower removal % ---> 50

Enter upper DBH ---> 28
Enter upper removal % ---> 10

Accept this thin (Y)? ---> <CR>
Executing thin by DBH control...
<CR> to continue
```

2. Basal Area Thin (BA)

You can choose a basal area thin to remove a certain amount of basal area from the stand. ORGANON first prompts you for the species or species group to which the basal area thin will be applied. The total amount of basal area in the species group you selected will then be displayed on the screen. ORGANON prompts you for the basal area amount to be cut. The basal area cut can be performed from above, below or proportionally across the diameter classes.

In the following example, ORGANON prompts you for a basal area thin. The user selects a thin from above of 20.5 square feet of basal area in DOUGLAS FIR.

```
BASAL AREA THIN EXAMPLE

MANAGE ---> BA
SPECIES OR SPECIES GROUP
DESIRED (AL) ---> DF

Basal Area control:

A - from above
B - from below
P - proportional

Enter BA Control> A
Total Basal Area = 63.0 sq. ft. for
DOUGLAS FIR
Enter BASAL AREA (sq.ft.) to remove> 20.5

Accept this thin (Y)?> <CR>
Executing BA thin from above...
```

3. Stand Density Index Thin (DI)

The current value for Reineke's stand density index is displayed. ORGANON then prompts you for the desired target stand density index. This target stand density index can be achieved by cuts from above, cuts from below, or by proportional cuts. ORGANON attempts to reach the specified target stand density index, although in some circumstances, that target can only be approached.

For this reason, ORGANON displays the final stand density index achieved. Another thinning attempt, using the same target except from below instead of above (or vice versa), usually achieves an exact target stand density index. In the following example, a user selects a proportional stand density index thinning to a target SDI of 200.0.

STAND DENSITY INDEX THIN EXAMPLE

MANAGE ---> **DI**
Stand Density Index is currently: 99.
Target SDI ? ---> **75.**

A - from above
B - from below
P - proportional

Enter SDI control from ---> P

Accept this thin (Y)? ---> **<CR>**
Executing SDI Proportional thin...
Stand Density Index is currently: 75.

4. User Code Thin (US)

As defined previously, a numeric user code (with a value between 1 and 99) is a variable that you can enter for each tree record that can later be used in thinning. When you select 'US', ORGANON prompts you for the user code along with the percent of that user code to thin. In the following example, 20 percent of all trees with a user code of 0 are to be cut.

USER CODE THIN EXAMPLE

MANAGE ---> **US**
Enter user code to thin ---> **0**
Enter percent to cut ---> **20**

Accept this thin (Y)? ---> **Y**
Executing thin by user code 0...

b. Fertilization (FE)

This routine is not currently active.

c. Ingrowth (IN)

Ingrowth selection from the management menu allows the addition of small trees to the tree list. All trees added must have a breast height diameter less than 2 inches and a height greater than 4.5 feet. Expansion factors (i.e. the number of trees per acre the ingrowth tree represents) will not be adjusted in any way and must be input for the stand.

The following example shows the procedure for adding ingrowth trees to a stand.

INGROWTH EXAMPLE

[INGROWTH TREE DESCRIPTION]

Describe each ingrowth tree. A carriage return <CR> will enter a default value of zero (0).

TREE # 1

Tree Species Code (Required-Integer) ---> **202**

Diameter at Breast Height [< 2"]
(Required-Real) -> **1.5**
Height in feet [>4.5']
(Strongly Recommended-Real) -> **4.9**
Crown Ratio (Strongly Recommended-Real) -> **.8**

Number of trees per acre this tree represents
(Required) -> **46**
User 2-digit thinning code (Optional-Integer)**><CR>**

Species: 202
DBH: 1.5
HT: 4.9
CR: .80
EXP: 46.0
USER: 0 Save this tree (Y)? <CR>

Another tree (Y)? N

1 TREE ADDED TO STAND: TEST PLOT278

Ingrowth trees are listed separately during trial management reports and plots. After accepting ingrowth management (PM), the ingrowth trees are included in the appropriate diameter class. Not accepting trial management (VM) removes all ingrowth trees from the stand (see TRIAL VS ACCEPTED MANAGEMENT).

CUT PER/ACRE STAND TABLE EXAMPLE

TEST PLOT278 [11-24-87 12:47PM] Page 1
TRIAL CUT PER ACRE STAND TABLE
AT 41 YEARS FOR ALL SPECIES

	RESIDUAL				REMOVAL			
diam class	trees/ acre	ba	cf vol	Scrib vol	trees/ acre	ba	cf vol	Scrib vol
Ingrowth	46.0	.6	2.	0.	.0	.0	0.	0.
0 - 2"	34.6	.1	0.	0.	22.3	.0	0.	0.
2 - 4"	.0	.0	0.	0.	.0	.0	0.	0.
4 - 6"	88.9	12.0	163.	261.	182.3	24.6	331.	521.
6 - 8"	9.8	2.4	40.	126.	18.8	4.5	77.	241.
8 -10"	15.7	6.8	134.	315.	27.2	11.7	231.	545.
10 -12"	6.8	4.6	89.	177.	14.1	9.8	193.	395.
12 -14"	.0	.0	0.	0.	30.2	28.3	615.	1519.
Totals	201.8	26.4	428.	879.	294.8	79.0	1447.	3220.

d. Final Harvest (FH)

When you choose a final harvest, all remaining trees in the stand, regardless of species, are cut. The only selections available from the main menu after a final harvest are CUT REPORTS and RESTART. The cuts are included on the YIELD TABLE, if requested, and the CUMULATIVE CUT LOG TABLE. The following is an example of selecting a Final Harvest option.

FINAL HARVEST EXAMPLE

MANAGE ---> **FH**
[FINAL HARVEST]
*** PLEASE NOTE ***
HARVEST RESULTS IN ALL TREES TO
CUT TABLE & NO FURTHER STAND GROWTH !
From MANAGEMENT MENU, accept final harvest
with 'PM' -- reject harvest with '<CR>'
[<CR> - To Management Menu]
<CR> to continue...

MANAGE ---> **PM**
Selected management executing...
[please wait yield table values are being calculated]
[please wait for Cumulative Cut Log Table...]
<CR> to continue...

e. Creating a Management Scheme ('LAYERED' MANAGEMENT)

All management options are performed in a 'layered' fashion. A number of management options are available and you can choose any number of them with their effects added to previous management decisions. As a result, a cumulative management scheme is performed. This allows you to design any manner of thin desired. The stand may be viewed via REPORTS at any point while the management scheme is being built. If too much has been cut, a you can choose RESTART to begin again. If not enough has been cut, you can choose a new 'layer' of thinning to increase the cut. Because of this 'building' scheme, ORGANON prompts you to verify each thinning decision to avoid possible re-entry of a multilayer thin due to typing error. The following example shows thinning of all mistletoe trees marked as user code 1 and 50% of all hardwoods under 10".

CREATING A MANAGEMENT SCHEME EXAMPLE

MANAGE ---> **US**
Enter user code to thin ---> **1**
Enter percent to cut ---> **100**
Accept this thin (Y)? --> **<CR>**
Executing thin by user code 1...

MANAGE ---> **DB**
SPECIES GROUP (AL) ---> **<CR>**

[*** WARNING ***]

Lower DBH value 'not' included...
Upper DBH value included...
(i.e. lower < CUT <= upper)

Enter lower DBH ---> **0**
Enter lower removal % ---> **50**
Enter upper DBH ---> **10**
Enter upper removal % ---> **50**
Accept this thin (Y)? ---> <CR>
Executing thin by DBH control...
MANAGE ---> **PM**

f. Trial vs Accepted Management

As the construction of a management scheme is progressing by 'layering', each thin is being performed on a trial basis. This means the stand has not actually been changed. A new layer of management can be added until the final result has been achieved. All cut reports viewed at this time are labeled as 'TRIAL' only. When the management is satisfactory, the 'TRIAL' cut can only become permanent by specifically designating acceptance. The acceptance Accepting PM (PERFORM MANAGEMENT) takes you out of the management menu back to the main menu. If unacceptable, a decision to void the management and return the stand back to its original condition VM (VOID MANAGEMENT) also exits management and sends you back to the main menu. To void the management but remain in the management menu for another try, choose RESTART. After you leave management by choosing 'PM', MANAGEMENT no longer is available from the master menu until after the next growth cycle. If you choose a VM exit from management, MANAGEMENT is still available from the master menu.

g. Reports (RR or CR)

Reports are available during management in order to view the cumulative effects upon the stand of any management decisions that have been selected (even on a trial basis). During management, RESIDUAL REPORTS display the stand as it appeared before management. CUT REPORTS display the cumulative results of all management selections.

h. Restart Management (RS)

Restart terminates the current management selections. The stand is returned to the condition prior to entry into the management routine. The stand is now ready to begin a new management selection. If no new management is selected, choose a Void Management (VM) exit instead of RESTART.

RESTART MANAGEMENT EXAMPLE

MANAGE ---> **RS**
MANAGE --->

i. Management Exit

1. Void Management (VM)

After a management option or options have been made on a trial basis, you may view any of the residual or cut reports. If, at that time, the results of the management are not as desired, you can void all management options and leave the MANAGEMENT MENU, and go back to the MASTER MENU. The stand then remains as it was prior to entering the management selection. Be sure to check this because CUT REPORTS are available only after a cut and they are otherwise unavailable. The RESIDUAL REPORTS selection displays the stand for confirmation. If the management performed was not desired, but another management attempt will be made, select a RESTART (RS) rather than a Void Management (VM) exit. MANAGEMENT is again available from the master menu.

VOID MANAGEMENT EXAMPLE

MANAGE ---> **VM**
MANAGE --->

2. Perform Management (PM)

By selecting PERFORM MANAGEMENT, the management scheme, as previously defined by selections, becomes a permanent action on the stand and all re-

ports reflect that change on a permanent—not trial— basis. MANAGEMENT will no longer be available from the master menu until after the next growth cycle.

PERFORM MANAGEMENT EXAMPLE

```
MANAGE ---> PM

Selected management executing...
[please wait -- Cumulative Cut Log Table
 being calculated]
<CR> to continue...

ORGANON --->
```

5. Restart ORGANON (RS)

When you select RESTART from the main menu, all output is saved from the current model run, if requested. ORGANON then re-initializes and begins from the point of entering a file name of a previously edited data file. In the following example, ORGANON is restarted, the yield table is saved but cumulative cut log table is not saved. A new data file, called PLOT356, is then selected for the next analysis.

RESTART ORGANON EXAMPLE

```
ORGANON ---> RS

Save yield table (N)? ---> Y
Save cumulative cut log table (N)? ---> <CR>

Enter tree data file name [NO extension (i.e.
A:MYFILE) ] ---> PLOT356
```

6. Quit (QU)

When an ORGANON run ends, you must choose QUIT or RESTART to properly close all files associated with that run.

ORGANON QUIT EXAMPLE

```
ORGANON ---> QU
[please wait -- yield table transfer is proceeding]
[please wait -- cumulative cut log table
 transfer is proceeding]
[ALL OUTPUT HAS BEEN WRITTEN TO FILE:
 OUT278]
 Stop - Program terminated.
 C:\MODEL >
```

a. Final Output and Run History

After QUIT or RESTART, the output file is closed and consists of all stand parameters, calibrations, program defaults, tables and plots previously requested for file output along with the yield table, if requested. A cumulative cut log table follows the yield table. The final report in the output file will be a run history which is the same as the Run History available during program execution in the CUT and RESIDUAL REPORT MENUS. This report represents the final run history. Each growth request will be listed with stand age and number of cycles, each management option will be itemized as to type and species, and each fertilization will include age and quantity. You should request plots and tables during program execution to save in an output file as well as to display on the screen. In this way, the stand description, defaults and run history are associated with the reports requested.

An output listing of sample file PLOT278 follows. The stand is grown one cycle. All species are proportionally thinned to 20 square feet basal area, and all species are also thinned 20% for all user codes of 0. The stand is grown for two more cycles then clear cut. An example is included of a plot requested with a window.

FINAL OUTPUT FILE AND RUN HISTORY EXAMPLE

O R G A N O N

ORegon Growth ANalysis and projectiON system
Growth & Yield Project for
Southwest Oregon Mixed Conifer Forests

RELEASE VERSION 2.0 - #SWO-0000
Copyright 1989 by College of Forestry, Oregon State University
by David W. Hann
Arlene Hester, David Larsen, and Martin Ritchie
Department of Forest Management
Oregon State University

This model was funded by:
Forestry Intensified Research (FIR)
with
special help from
Boise Cascade Corporation
&
Medford Corporation
[11-24-88 8:39 AM]

Tree Data File: PLOT278
Stand Identification: TEST PLOT278
Number of Plots/Points: 4
Number of Sample (obs.) Trees: 19

EXPANSION FACTORS WERE SET AS FOLLOWS:
SUBSAMPLE 1 ---> FIXED 7.8 ft. radius
SUBSAMPLE 2 ---> FIXED 15.6 ft. radius
SUBSAMPLE 3 ---> VARIABLE BAF = 20.0

Douglas Fir Site Index = 109.4
Ponderosa Pine Site Index = 102.9
Breast height stand age = 28
Total stand age - 36
Run Defaults:

1.	TRIPLING:	No
2.	DISPLAY MENUS:	Yes
3.	USE HEIGHT CALIB:	Yes
4.	USE HTCB CALIB:	Yes
5.	USE DIAM. GRO CALIB:	Yes
6.	LIMIT ON MAX. BA:	Yes
7.	YIELD TABLE:	Yes
8.	MORTALITY TABLE:	No
9.	PRINTER FORM FEED:	No
10.	GRAPHICS PRINTER:	Yes
11.	VOLUME EQUATIONS:	OSU

(continued)

FINAL OUTPUT FILE AND RUN HISTORY EXAMPLE (continued)

Board Foot Defaults:

12.	LOG TOP DIAM:	4. inches
13.	TRIM ALLOWANCE:	8. inches
14.	STUMP HEIGHT:	.5 feet
15.	LOG LENGTH:	32 feet
16.	MIN LOG LENGTH:	8.0 feet

Cubic Foot Defaults:

17.	CONIFER TOP DIAM:	0. inches
18.	HARDWOOD TOP DIAM:	0. inches
19.	CONIFER STUMP HEIGHT:	.0 feet

CALIBRATION RATIOS USED FOR THIS RUN:

	ht/diam	htcb	diam
DOUGLAS FIR	.70	1.23	1.00
GRAND/WHITE FIR	1.00	1.00	1.00
PONDEROSA PINE	1.00	1.00	1.00
SUGAR PINE	1.00	1.00	1.00
INCENSE CEDAR	1.00	1.00	1.00
WESTERN HEMLOCK	1.00	1.00	1.00
MADRONE	1.00	1.00	1.00
CHINKAPIN	1.00	1.00	1.00
TANOAK	1.00	1.00	1.00
CANYON LIVE OAK	1.00	1.00	1.00
BIG LEAF MAPLE	1.00	1.00	1.00
WHITE OAK	1.00	1.00	1.00
BLACK OAK	1.00	1.00	1.00

--> --> --> --> --> --> W A R N I N G <-- <-- <-- <-- <-- <--
50 SAMPLE TREES IS THE MINIMUM RECOMMENDED !!!
--> --> --> --> --> --> W A R N I N G <-- <-- <-- <-- <-- <--

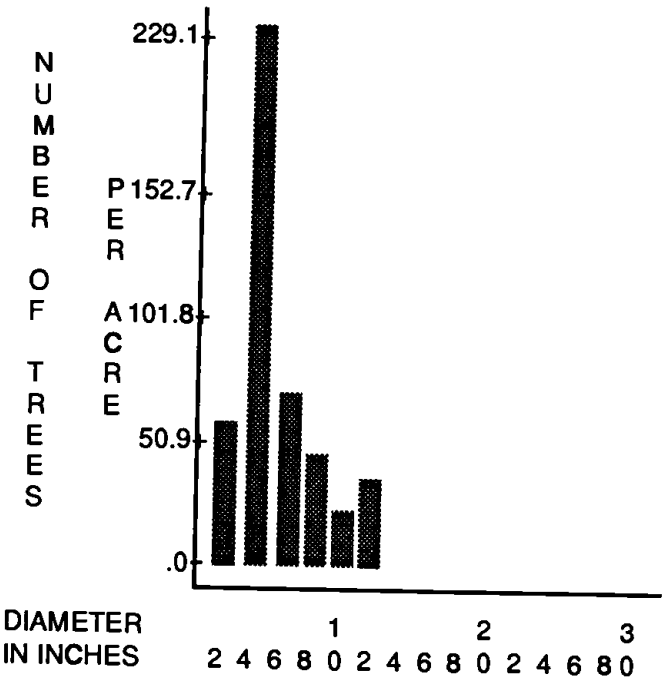
TEST PLOT278 [11-24-88 8:46 AM] Page 1
INITIAL PER ACRE STAND TABLE AT 36 YEARS FOR ALL SPECIES

	ENDING				NET 0 YEAR CHANGE			
diam class	trees/ acre	ba	cf vol	Scrib vol	trees/ acre	ba	cf vol	Scrib vol
0 - 2"	57.3	.0	0.	0.				
2 - 4"	229.1	15.0	142.	0.				
4 - 6"	71.6	8.4	112.	0.				
6 - 8"	43.0	12.4	197.	571.				
8 -10"	20.9	10.0	158.	357.				
10 -12"	30.2	20.0	362.	701.				
Totals	451.9	65.8	970.	1628.				

(continued)

FINAL OUTPUT FILE AND RUN HISTORY EXAMPLE (continued)

TEST PLOT278 [11-24-88 8:46 AM]
PER ACRE DIAM. DIST. TOTAL 36 YEARS FOR ALL SPECIES



TEST PLOT278 [11-24-88 8:47 AM] Page 1
PER ACRE STAND TABLE AT 41 YEARS FOR ALL SPECIES

	RESIDUAL				NET 5 YEAR CHANGE			
diam class	trees/ acre	ba	cf vol	scrib vol	trees/ acre	ba	cf vol	scrib vol
0 - 2"	56.9	.1	1.	0.	-.4	.1	1.	0.
2 - 4"	.0	.0	0.	0.	-229.6	-15.0	-142.	0.
4 - 6"	271.2	36.6	493.	782.	199.6	28.2	381.	782.
6 - 8"	28.6	6.9	117.	367.	-14.4	-5.4	-80.	-204.
8 -10"	42.9	18.5	365.	860.	22.0	8.5	207.	503.
10 -12"	20.8	14.4	282.	571.	-9.3	-5.6	-79.	-129.
12 -14"	30.2	28.3	615.	1519.	30.2	28.3	615.	1519.
Totals	450.6	104.	1873.	4099.	-1.3	39.	1903.	2470.

(continued)

FINAL OUTPUT FILE AND RUN HISTORY EXAMPLE (continued)

YIELD TABLES

TEST PLOT278 Page 1
DATA FILE: PLOT278 [11-24-88 8:42 AM]

species	at yr	trees/ acre	ba	cf vol	Scrib vol	trees/ acre	ba	cf vol	Scrib vol
		ENDING		RESIDUAL YIELD		0-YR CHANGE			
Doug Fir	36	451.9	65.8	970.	1628.				
TOTAL:		451.9	65.8	970.	1628.				
		TOTAL MAI:		27.	45.				
		CONIFER MAI:		27.	45.				
		ENDING		RESIDUAL YIELD		0-YR CHANGE			
Doug Fir	41	450.6	104.9	1873.	4099.	-1.3	39.1	902.	2470.
TOTAL:		450.6	104.9	1873.	4099.	-1.3	39.1	902.	2470.
		TOTAL MAI:		46.	100.	PAI:		180.6	494.
		CONIFER MAI:		46.	100.	PAI:		180.6	494.
		RESIDUAL		CUT YIELD		REMOVAL			
Doug Fir	41	201.8	26.4	428.	879.	294.8	79.0	1447.	3219.
TOTAL:		201.8	26.4	428.	879.	294.8	79.0	1447.	3219.
		ENDING		RESIDUAL YIELD		5-YR CHANGE			
Doug Fir	46	200.3	41.3	796.	2400.	-1.5	14.8	367.9	1521.
TOTAL:		200.3	41.3	796.	2400.	-1.5	14.8	367.9	1521.
		TOTAL MAI:		49.	122.	PAI:		73.6	304.
		CONIFER MAI:		49.	122.	PAI:		73.6	304.
		ENDING		RESIDUAL YIELD		5-YR CHANGE			
Doug Fir	46	199.7	62.5	1387.	3927.	-.6	21.2	590.5	1527.
TOTAL:		199.7	62.5	1387.	3927.	-.6	21.2	590.5	1527.
		TOTAL MAI:		56.	140.	PAI:		118.1	305.
		CONIFER MAI:		56.	140.	PAI:		118.1	305.
		ENDING		RESIDUAL YIELD		5-YR CHANGE			
Doug Fir	46	199.4	90.6	2263.	6732.	-.3	28.1	876.2	2804.
TOTAL:		199.4	90.6	2263.	6732.	-.3	28.1	876.2	2804.
		TOTAL MAI:		66.	178.	PAI:		175.2	561.
		CONIFER MAI:		66.	178.	PAI:		175.2	561.

(continued)

FINAL OUTPUT FILE AND RUN HISTORY EXAMPLE (continued)

YIELD TABLES

TEST PLOT278 Page 2
DATA FILE: PLOT278 [11-24-88 8:42 AM]

species	at yr	trees/ acre	ba	cf vol	Scrib vol	trees/ acre	ba	cf vol	Scrib vol
		ENDING		RESIDUAL YIELD		5-YR CHANGE			
Doug Fir	61	199.2	125.3	3473.	1448.	-.2	34.8	1209.	4716.
TOTAL:		199.2	125.3	3473.	1448.	-.2	34.8	1209.	4716.
		TOTAL MAI:		99.	240.	PAI:		241.9	943.
		CONIFER MAI:		99.	240.	PAI:		241.9	943.
		ENDING		RESIDUAL YIELD		5-YR CHANGE			
Doug Fir	66	199.0	165.8	5102.	7837.	-.2	40.4	1629.	6388.
TOTAL:		199.0	165.8	5102.	7837.	-.2	40.4	1629.	6388.
		TOTAL MAI:		99.	319.	PAI:		326.0	1278.
		CONIFER MAI:		99.	319.	PAI:		326.0	1278.
		RESIDUAL		FINAL HARVEST		REMOVAL			
Doug Fir	66	.0	.0	0.	0.	199.	165.8	5102.	7837.
TOTAL:		.0	.0	0.	0.	199.	165.8	5102.	7837.

CUMULATIVE CUT LOG TABLE

TEST PLOT278 [11-24-88 8:42 AM]
LOG LENGTH: 32 feet MIN LOG LENGTH: 8.0 feet TOP DIAM: 4.0 inches

Diameter	Doug Fir Logs	Doug Fir Vol	G/W Fir Logs	G/W Fir Vol	P/S Pine Logs	P/S Pine Vol	Other Conifer Logs	Other Conifer Vol
4 -- 6"	365.4	6038.5	.0	.0	.0	.0	.0	.0
6 -- 8"	47.4	2695.0	.0	.0	.0	.0	.0	.0
8 -- 10"	77.2	6124.7	.0	.0	.0	.0	.0	.0
10 -- 12"	14.6	1887.8	.0	.0	.0	.0	.0	.0
12 -- 14"	15.6	2636.5	.0	.0	.0	.0	.0	.0
14 -- 16"	6.7	1674.4	.0	.0	.0	.0	.0	.0
TOTALS								
Logs:	527.0		.0		.0		.0	
Volumes:	21056.9		.0		.0		.0	
AVG VOLUME:	40.0		.0		.0		.0	

(continued)

FINAL OUTPUT FILE AND RUN HISTORY EXAMPLE (continued)

```
     RUN HISTORY
**************************************************
YR   ACTIVITY
**************************************************

 36  GROWTH ---> 1 CYCLE
 41  THIN DBH (DF) 2.5 "->50 %  28  " ->10 %

 41  THIN BA  (DF) from above  --> 20.5 sq ft
 41  SDI THIN proportional -> Target 75
 41  THIN USER CODE =  0 ->  20 %
 41   INGROWTH (46  TPA - DOUGLAS FIR)
 41  GROWTH ->  5 CYCLES
 66  FINAL HARVEST
```

b. Supplementary Program 'PLTYLD'

If you request a yield table in the ORGANON growth model run, a supplementary program named 'PLTYLD' can read an ORGANON output file containing a yield table and generate plots of specified yield table variables over stand age (for even-age stands) or elapsed time (for uneven-aged stands). You need only provide an ORGANON output file name (including drive designator, if necessary) and the plots desired. The following yield table variables may be plotted:

- trees per acre
- basal area per acre
- cubic foot volume per acre
- Scribner volume per acre
- total cubic foot mean/periodic annual increment
- total Scribner mean/periodic annual increment
- conifer cubic foot mean/periodic annual increment
- conifer Scribner mean/periodic annual increment.

The 'PLTYLD' program is on Disk 1. Hard disk users should have already loaded this program onto their designated ORGANON directory. All others must load the disk containing the 'PLTYLD' program, Disk 1, into drive A and the ORGANON output file(s) for plotting in drive B. Be sure to include B: when entering the ORGANON output file name.

Display destination (Screen or Printer ONLY) and plot windows must be selected for these plots in the same manner as for display of CUT or RESIDUAL REPORTS described earlier in the main ORGANON program. The following example displays screens showing a plot of Trees Per Acre and Total Cubic Foot Mean/Periodic Annual Increment.

'PLTYLD' EXAMPLE FOR FLOPPY DISK USERS

```
A:> PLTYLD

                    O R G A N O N
              Growth and Yield Project
        Southwest Oregon Mixed Conifer Forests
                 SW OREGON VERSION
              EDITION 2.0 - #SWO-0000

Enter ORGANON output file name
(<CR> to STOP)  ---> B:OUT278

Would you like these reports displayed on:
 SO - Screen Only
 PO - Printer Only
 DISPLAY (SO) ---> <CR>

Indicate the variable to be plotted:
1. Trees/Acre
2. Basal Area
3. Cubic Foot Volume
4. Scribner Volume
5. Total Cubic Foot Mean/Periodic Annual
   Increment
6. Total Scribner Mean/Periodic Annual Increment
7. Conifer Cubic Foot Mean/Periodic Annual
   Increment
8. Conifer Scribner Mean/Periodic Annual
   Increment
                 [ <CR> to END ]
```

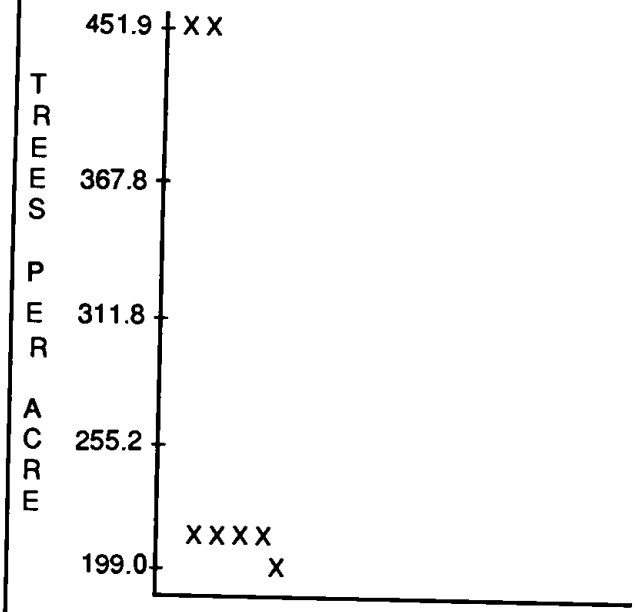
'PLTYLD' EXAMPLE (continued)

'PLTYLD' EXAMPLE [continued]

VARIABLE NUMBER ---> 1
Window? <N> ---> **<CR>**

[please wait -- yield plot values are being read]

TEST PLOT278 [11-24-88 8:45 AM]
TREES PER ACRE YIELD



Indicate the variable to be plotted:
1. Trees/Acre
2. Basal Area
3. Cubic Foot Volume
4. Scribner Volume
5. Total Cubic Foot Mean/Periodic Annual Increment
6. Total Scribner Mean/Periodic Annual Increment
7. Conifer Cubic Foot Mean/Periodic Annual Increment
8. Conifer Scribner Mean/Periodic Annual Increment

[<CR> to END]

VARIABLE NUMBER ---> **5**
Window? <N> ---> **<CR>**

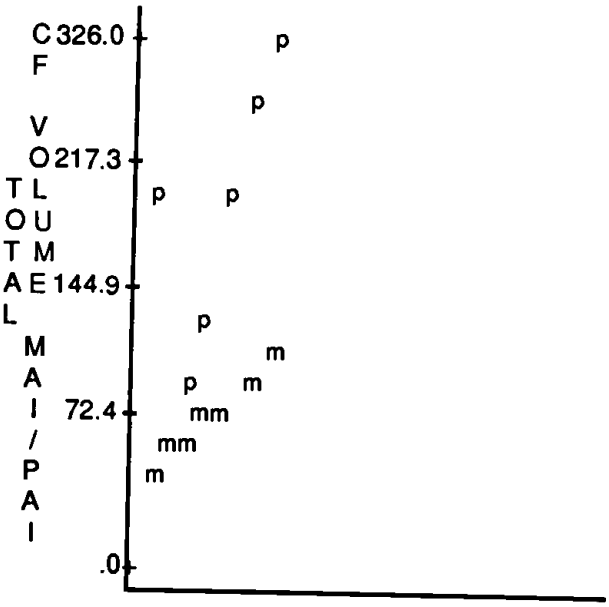
(continued)

'PLTYLD' EXAMPLE (continued)

[please wait -- yield plot values are being read]

TEST PLOT278 [11-24-88 8:50 AM]

TOTAL CUBIC FT. VOLUME MEAN ANNUAL INCREMENT/PERIODIC ANNUAL INCREMENT


326.0
217.3
144.9
72.4
.0
TOTAL CUBIC FT. VOLUME MEAN ANNUAL INCREMENT/PERIODIC ANNUAL INCREMENT
p
m
mm
Total Stand age 36 yr+
1 1 1 1 1 1
1 1 2 2 3 3 4 4 5 5 6 6 7 7 8 8 9 9 0 0 1 1 2 2
0 5 0 5 0 5 0 5 0 5 0 5 0 5 0 5 0 5 0 5 0 5 0 5 0 5

Indicate the variable to be plotted:
1. Trees/Acre
2. Basal Area
3. Cubic Foot Volume
4. Scribner Volume
5. Total Cubic Foot Mean/Periodic Annual Increment
6. Total Scribner Mean/Periodic Annual Increment
7. Conifer Cubic Foot Mean/Periodic Annual Increment
8. Conifer Scribner Mean/Periodic Annual Increment

VARIABLE NUMBER ---> **<CR>**

Stop - Program terminated.

WARNING AND ERROR MESSAGES

ORGANON may display error or warning messages during program execution. The following list describes the messages that ORGANON issues to a user should problems occur during program execution. The interpretations of warnings and error messages should clarify their meaning so you can maintain your work flow with ORGANON.

MESSAGE	MEANING
All errors have NOT been corrected. ORGANON cannot be run.	After exit from the correction module, there are still tree data errors that have not been corrected. Re-entry to the corrector module will occur until all errors are corrected.
*** ALL OUTPUT HAS BEEN WRITTEN TO FILE xxxx	At the end of an ORGANON run or at the point of a restart request, the yield table is written to the end of the designated output file shown in quotes. Following the yield table is a history of the completed ORGANON run.
xxx crown ratios predicted from yyy entered	During raw data file entry, crown ratios were predicted for xxx trees with missing crown ratios by equation and calibration ratio determined by yyy trees with entered crown ratios for the same species.
CROWN WIDTH OF TREE xx IS OUT OF RANGE DBH=xxx HEIGHT=xxx DIAMGRO=xxxx HTGRO=xxxx Program Terminated due to above error.	During data completion or diameter growth, a maximum crown width for the specified tree was calculated and determined to be less than 0 or greater than 100 using the equations of Paine and Hann (1982). Program execution is terminated.
*** DBH=0.0 FOR TREE xxx IS NOT VALID	An illegal tree diameter of 0. has been read from the input file.
*** ERROR -- NO TREES LEFT	When in the correction module, all tree records have been designated to be deleted.

MESSAGE	MEANING
*** ERROR -- ONLY xx TREES WERE ENTERED	During tree data correction, the tree record number specified to edit was greater than the number of trees entered.
*** ERROR--REENTER --->	The user-requested input has been rejected. This can happen when: 1. A real number has been entered when an integer is requested. 2. A character has been entered when a numeric value has been requested. 3. Some character other than YES, yes, NO or no has been entered when a Yes/ No answer was requested. 4. A invalid character has been entered for a requested character. 5. A numeric value does not fall within the requested range.
EXECUTION ENDED WITH > 50% OF TREES OVER 120 YEARS	A warning that the current growth cycle is completed and more than 50% of the major have reached growth-effective age greater than 120 years at breast-height. No more growth will be allowed after this point.
FILE 'ORGANON.DEF' DOES NOT EXIST!	During default selection, a request was made to use the preset user defaults in file ORGANON.DEF on the default drive. This file does not exist at this time and selection <3> should be used to create this file.
FILE 'xxx' DOES NOT EXIST! (Drive OK?)	When a file name for an existing file is requested in ORGANON, the file name entered did not exist on the specified drive. If a drive was not specified, the file did not exist on the default drive. Be sure to enter the drive specification or check the spelling of the file name. Data files must have no extensions.

MESSAGE	MEANING
FILE 'xxx' DOES NOT EXIST! Either re-enter a data file name (check DRIVE or enter <CR> to STOP.	When an ORGANON output file name is requested in PLTYLD, the file name entered did not exist on the specified drive. If a drive was not specified, the file did not exist on the default drive. Be sure to enter the drive specification or check the spelling of the file name. A carriage return will indicate no more output files to plot.
FILE 'xxx' EXISTS! -- OVERWRITE?	When an output file name is requested, a check is made to see if the output file name entered already exists. If it does, a check is made if it should be overwritten. This check is also made during the creation of a batch file.
*** GROWTH TERMINATED -- MORE THAN 50% OF MAJOR SPECIES TREES OVER 120 YEARS	During a growth cycle when subsequent cycles have been requested, this message warns that no more of the requested cycles will be executed as more than half of the major species have reached growth effective ages over 120 years at breast height.
*** HEIGHT <= 4.5' FOR TREE xxx IS NOT VALID	Heights entered from the input data file must be greater than 4.5 feet.
*** ILLEGAL PLOT/POINT NUMBER OR BLANK LINE FOR TREE xxx RECORD WILL BE IGNORED***	A blank line has been read from the input data file or the plot/point number is an illegal 0.
*** ILLEGAL SPECIES CODE xxx FOR TREE yyy	A species code read from the input file is no tone of the legal species codes listed in the SPECIES CODE NUMBER section.

MESSAGE	MEANING
Maximum number of trees (2000) reached.	When adding trees during ingrowth management, the tree list has reached 2000 and no more ingrowth trees may be added.
***NO GROWTH CYCLES POSSIBLE - - ALL TREES HARVESTED	No more growth cycles can be requested as all trees have been harvested by accumulated thins or a FINAL HARVEST had been conducted on the stand.
*** NO GROWTH CYCLES POSSIBLE -- > 50% TREES OVER AGE 120	No more growth cycles can be requested as more than half the major species have reached a growth effective age of over 120 years at breast height.
*** NO GROWTH CYCLES POSSIBLE ---NO REMAINING MAJOR SPECIES	No more growth cycles are possible as all of the major species trees have been cut.
*** No species in that group...	During reports or management, a species is selected for display or management. This message will appear if the species does not exist or no longer exists because of previous management selections.
Not enough species in that group...	In a plot during initial data entry, a calibration plot has been requested for a species in which there were not enough entries to determine a calibration other than 1.0.
*** NUMBER OF CYCLES REQUESTED WILL CAUE AGE TO EXCEED MAX STAND AGE	When selecting the number of cycles to grow a stand, a number has been selected which will cause the stand to exceed the maximum breast-height stand age based upon the entered age of an even-age stand or 125 years for an uneven age stand.

MESSAGE	MEANING
*** ONLY xx CYCLES WILL BE RUN	The number of cycles requested for growth exceeds the maximum allowed, and only the number of cycles to reach that maximum will be grown.
*** ORGANON WILL CALCULATE	In the corrector module, a missing variable was specified that ORGANON will compute during the data completion step following. This will include expansion factors and heights only.
*** xxx % OF THE MAJOR SPECIES TREES ARE OVER 120 YEARS	xxx % of the major species trees are over 120 growth-effective years during this growth cycle. This is a warning only advising ofthe approach to the 50% point at which time no more growth cycles can be performed.
*** please wait - xxxxxxxxxxxxxxxx	ORGANON is busy calculating, reading or writing and the model will not resume execution until this action is completed.
QUESTIONABLE MERCHANTABLE HEIGHT!!!	During calculations of log volume from taper equations, merchantable tree height has been determined to be negative or greater than the total tree height.
*** STAND IDENTIFICATION 'xxxxxxxxx' *** ONLY FIRST 20 CHARACTERS WILL BE USED.	Stand identification title can only be 20 characters long. Only the first 20 characters of the identification will be used. All remaining characters are truncated.
SYSTEM OVERFLOW...MUST BE REPORTED	This message can only occur if the TRIPLING option has been selected. If this message occurs, please report all related stand information to College of Forestry, Forest Management, Oregon State University.

MESSAGE	MEANING
The following are the data scan results... Errors MUST be corrected before model is run.	After the raw data file is input, a list of invalid or missing elements is listed. Invalid elements must be corrected before further model execution.
The maximum number of trees has been exceeded. Program execution is terminated.	A maximum of 2000 trees can be input from the data input file. Reduce size of input file by reducing the number of sample plots taken in the stand. This can be done by dividing the stand into several smaller stands or by randomly eliminating sampling plots.
THERE WERE NO MAJOR SPECIES (DF, WF, GF, PP, SP, IC) ENTERED. THIS DATA FILE WILL NOT BE ACCEPTED BY ORGANON.	All data sets input to ORGANON must contain trees from the six major species groups.
*** THIS ROUTINE DOES NOT WORK!!	The coding for this routine has not been completed making this option unavailable at the present time.
xxx tree heights predicted from xxx entered	During raw data file entry, tree heights were determined for xxx trees with missing heights by equation and calibration ratio determined by trees with entered heights in the same species.
xxx tree records have been read...	xxx trees have been read into the main ORGANON module from the '.INP' file.
*** UNACCEPTABLE xx SITE INDEX VALUE	Unacceptable DF or PPsite index value has been input. DF and PP site index cannot be less than 44.5 or greater than 164.5.

MESSAGE	MEANING
--> --> W A R N I N G -- <-- DOUGLAS FIR SITE INDEX IS OUTSIDE THE RANGE USED TO BUILD ORGANON !!!	Douglas Fir site index must be in the range from 60 to 125, the range of the sampling set used to build the ORGANON model.
--> --> W A R N I N G <-- <-- 50 SAMPLE TREES IS THE MINIMUM RECOMMENDED.	Fifty trees is the minimum recommended number of trees to sample.
--> --> W A R N I N G <-- <-- MINIMUM AGE FOR A STAND IS 15 YEARS !!!	An even age stand must be a minimum age of 15 years.
*** WARNING *** Negative potential height growth set to 0 !!	During a growth cycle,the height growth of a tree has been calculated to be negative. The height growth will beset to 0 and the growth cycle will continue. This error will occur if the tree is taller than the maximum potential the tree could achieved for the stand's site index. To eliminate this problem, the user should consider increasing the stand's site index.
WARNING -- POINT xx HAS NO TREES	During data input, a valid point number has been read with all remaining fields blank or 0. This indicates a plot/point with no trees.
> > > > W A R N I N G > > > DF/GF/WF/SP/WH SITE INDEX MAY BE INCORRECTLY ESTIMATED. GROWTH MODEL MAY NOT WORK CORRECTLY.	Douglas Fir site index does not correspond to DF/WF/GF/SP/WH tree heights entered.
> > > > W A R N I N G > > > INCENSE CEDAR SITE INDEX MAY BE INCORRECTLY ESTIMATED. GROWTH MODEL MAY NOT WORK CORRECTLY.	Incense Cedar site index determined from the Douglas Fir site index does not correspond to the incense cedar tree heights entered.

MESSAGE	MEANING
--> --> W A R N I N G <-- <-- PONDEROSA PINE SITE INDEX IS OUTSIDE THE RANGE USED TO BUILD ORGANON !!!	Ponderosa pine site index must be in the range from 60 to 125, the range of the sampling set used to build the ORGANON model.
>>>>W A R N I N G >>> PONDEROSA PINE INDEX MAY BE INCORRECTLY ESTIMATED. GROWTH MODEL MAY NOT WORK CORRECTLY.	Ponderosa Pine site index does not correspond to Ponderosa Pine tree heights entered.
--> --> W A R N I N G <-- <-- STAND IS OUTSIDE LIMITS OF SPECIES MIX USED TO BUILD ORGANON.	If stand age is less than or equal to 40 years, at least 60% of the stand basal area must be in the major species. If the stand age is greater than 40 years, at least 80% of the stand basal area must be in the major species.

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The Southwest version of the ORegon Growth ANalysis and projectiON model is designed to project changes in young-growth forest stands of mixed conifers in southwest Oregon. Initial stands should have 80% basal area in Douglas-fir, grand fir, white fir, ponderosa pine, sugar pine, and incense-cedar. SW-ORGANON can predict development of both even-age and uneven-age stands. ORGANON is a user-friendly interactive program that will run on any IBM or compatible computer under the PC-DOS or MS-DOS operating system. The computer system should consist of two floppy disk drives or a hard disk drive and one or more floppy disk drives. A math co-processor is recommended but not mandatory.

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